



US seq list.ST25.txt
SEQUENCE LISTING

<110> Hotez, Peter
Ashcom, James
Bdamchian, Mahnaz
Zhan, Bin
Wang, Yan
Hawdon, John
Loukas, Alexander
Williamson, Angela
Jones, Brian
Bethony, Jeffrey
Goud, Gaddam
Botazzi, Maria E.
Mendez, Susana

<120> Hookworm Vaccine

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<150> US 60/329,533

<151> 2001-10-17

<150> US 60/332,007

<151> 2001-11-23

<150> US 60/375,404

<151> 2002-04-26

<150> PCT US02/33106

<151> 2002-10-17

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<213> Necator americanus

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Gly Leu Phe Ala Phe Ser Asn Met Val Tyr Ser Glu Thr Thr Lys Leu
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Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Leu Ala Val Ser Cys Ile
165 170 175

Tyr Asn Gly Val Gly Tyr Ile Thr Asn Gln Pro Met Trp Glu Thr Gly
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Gln Ala Cys Gln Thr Gly Ala Asp Cys Ser Thr Tyr Lys Asn Ser Gly
195 200 205

Cys Glu Asp Gly Leu Cys Thr Lys Gly Pro Asp Val Pro Glu Thr Asn
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225 230 235 240

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6 0

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<213> Necator americanus

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Page 9

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325 330 335Gln Asp Gln Lys Asp Lys Lys Tyr Tyr Trp Arg Ala Gly Lys Cys Leu
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65 70 75 80

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85 90 95

Gly Val Ile Gln Ile Gly Thr Pro Ala Gln Asn Phe Thr Val Ile Phe
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Asp Thr Gly Ser Ser Asn Leu Trp Val Pro Ser Arg Lys Cys Pro Phe
115 120 125

US seq list.ST25.txt

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165 170 175

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Leu Thr Phe Ile Ala Ala Lys Phe Asp Gly Ile Leu Gly Met Ala Phe
195 200 205

Pro Glu Ile Ala Val Leu Gly Val Thr Pro Val Phe His Thr Phe Ile
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Asn Pro Glu Ser Glu Ile Gly Glu Ile Thr Phe Gly Gly Val Asp
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Gly Ala Glu Pro Leu Met Lys Gly Glu Tyr Met Ile Pro Cys Asp Lys
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Val Pro Ser Leu Pro Asp Val Ser Phe Ile Ile Asp Gly Lys Thr Phe
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Ser Ile Cys Leu Ser Gly Phe Met Gly Met Asp Phe Pro Glu Lys Ile
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US seq list.ST25.txt

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Val Phe Asp Val Gly Gln Ala Arg Val Gly Phe Ala Gln Ala Lys Ser
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US seq list.ST25.txt

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<212> PRT
<213> Necator americanus

<400> 10

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20 25 30

Met Leu Arg Ala Gly Thr Trp Glu Thr Tyr Val Glu Gly Met Arg Lys
35 40 45

Arg Gln Leu Gln Leu Leu Lys Glu His Lys Val His Ile Gln Asp Val
50 55 60

Leu Gly Tyr Ala Asn Met Glu Tyr Leu Gly Glu Ile Thr Ile Gly Thr
65 70 75 80

Pro Gln Gln Lys Phe Leu Val Val Leu Asp Thr Gly Ser Ser Asn Leu
85 90 95

Trp Val Pro Asp Asp Ser Cys Tyr Lys Glu Lys Arg Pro Asp Arg Cys
100 105 110

Leu Val Ser Asn Cys Asp Ala Gly Leu Val Cys Gln Val Phe Cys Pro
115 120 125

Asp Pro Lys Cys Cys Glu His Thr Arg Glu Phe Lys Gln Val Asn Ala
130 135 140

Cys Lys Asp Lys His Arg Phe Asp Gln Lys Asn Ser Asn Thr Tyr Val
145 150 155 160

Lys Thr Asn Lys Thr Trp Ala Ile Ala Tyr Gly Thr Gly Asp Ala Arg
165 170 175

Gly Phe Phe Gly Arg Asp Thr Val Arg Leu Gly Ala Glu Gly Lys Asp
180 185 190

US seq list.ST25.txt

Gln Leu Val Ile Asn Asp Thr Trp Phe Gly Gln Ala Glu His Ile Ala
195 200 205

Glu Phe Phe Ser Asn Thr Phe Leu Asp Gly Ile Leu Gly Leu Ala Phe
210 215 220

Gln Glu Leu Ser Glu Gly Gly Val Ala Pro Pro Ile Ile Arg Ala Ile
225 230 235 240

Asp Leu Gly Leu Leu Asp Gln Pro Ile Phe Thr Val Tyr Phe Glu Asn
245 250 255

Val Gly Asp Lys Glu Gly Val Tyr Gly Gly Val Phe Thr Trp Gly Gly
260 265 270

Leu Asp Pro Asp His Cys Glu Asp Glu Val Thr Tyr Glu Gln Leu Thr
275 280 285

Glu Ala Thr Tyr Trp Gln Phe Arg Leu Lys Gly Val Ser Ser Lys Asn
290 295 300

Phe Ser Ser Thr Ala Gly Trp Glu Ala Ile Ser Asp Thr Gly Thr Ser
305 310 315 320

Leu Asn Gly Ala Pro Arg Gly Ile Leu Arg Ser Ile Ala Arg Gln Tyr
325 330 335

Asn Gly Gln Tyr Val Ala Ser Gln Gly Leu Tyr Val Val Asp Cys Ser
340 345 350

Lys Asn Val Thr Val Asp Val Thr Ile Gly Asp Arg Asn Tyr Thr Met
355 360 365

Thr Ala Lys Asn Leu Val Leu Glu Ile Gln Ala Asp Ile Cys Ile Met
370 375 380

Ala Phe Phe Glu Met Asp Met Phe Ile Gly Pro Ala Trp Ile Leu Gly
385 390 395 400

Asp Pro Phe Ile Arg Glu Tyr Cys Asn Ile His Asp Ile Glu Lys Lys
405 410 415

Arg Ile Gly Phe Ala Ala Val Lys His
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<210> 11
<211> 509
<212> DNA

US seq list.ST25.txt

<213> Ancylostoma caninum

<400> 11

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tccgaaactg	gacagacgtc	tctggagagg	agaagaaatt	gctcggAACG	ttcaaATGTG	420
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<212> PRT

<213> Ancylostoma caninum

<400> 12

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Cys	Lys	Cys	Glu	Lys	Lys	Pro	Arg	Pro	Pro	Leu	Glu	Lys	Leu	Leu	Cys
			20			25					30				

Gln	Ser	Gln	Phe	Val	Thr	His	Ala	Lys	Val	Thr	Lys	Lys	Arg	Ile	Asp
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Gly	Tyr	Phe	Ile	Tyr	Tyr	Asp	Leu	Glu	His	Lys	Glu	Val	Tyr	Lys	Pro
			50			55			60						

Lys	Asp	Arg	Ser	Ile	Pro	Ile	Glu	Leu	Phe	Ser	Trp	Arg	Glu	Lys	Glu
65					70		75					80			

Asn	Cys	Gly	Met	Pro	Asp	Leu	Glu	Glu	Gly	Lys	Glu	Tyr	Leu	Ile	Gly
			85					90				95			

Gly	Lys	Val	Thr	Asp	Tyr	Gly	Asp	Gly	Asp	Leu	Val	Ile	Ser	Val	Ser
			100			105					110				

Arg	Cys	Asp	Leu	Leu	Arg	Asn	Trp	Thr	Asp	Val	Ser	Gly	Glu	Glu	Lys
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Lys	Leu	Leu	Gly	Thr	Phe	Lys	Cys	Glu	Asn	Gln	Ser				
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US seq list.ST25.txt

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<213> Ancylostoma caninum

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US seq list.ST25.txt

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<211> 869

<212> PRT

<213> Ancylostoma caninum

<400> 14

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 35 40 45

Val Gly Glu Gln Asp Asn Thr Pro Val Leu Thr Asn Leu Leu Val Leu
 50 55 60

Glu Lys Glu Glu Leu Ala Ala Lys Leu Lys Lys Thr Pro Tyr Glu Glu
 65 70 75 80

Val Asp Glu Gln Thr Val Arg Gln Ser Ser Val Met Lys Leu Arg Asn
 85 90 95

US seq list.ST25.txt

Ile Lys Asn Ala Leu Phe Thr Ile Glu Pro Val Ala Ser Ala Leu Pro
100 105 110

Pro Leu Arg Val Asn Asp Pro Lys Tyr Cys Pro Ser Tyr Gly Glu Pro
115 120 125

Asp Lys Lys Tyr Ala Tyr Gln Glu Ala Ala Ser Tyr Leu Leu Ser Gly
130 135 140

Leu Asp Gln Thr Val Asp Pro Cys Glu Asp Leu Tyr Ala Phe Thr Cys
145 150 155 160

Asn Thr Tyr Leu Arg Asn His Asn Ala Thr Asp Ile Gly Val Asn Arg
165 170 175

Ile Gly Thr Tyr Lys Asp Ala Gln Asp Asp Val Asn Ala Glu Ile Val
180 185 190

Glu Ala Leu Glu Glu Val Asn Val Ser Asp Thr Lys Trp Ser Glu Thr
195 200 205

Glu Arg Leu Val Lys Ala Thr Leu Phe Thr Cys Val His His Thr Arg
210 215 220

Ala Arg Lys Pro Ile Asp Asn Ser Lys Asn Val Leu Ile Glu Met Arg
225 230 235 240

Asp Leu Phe Gly Gly Ile Pro Phe Leu Asn His Thr Leu Lys Lys Asp
245 250 255

Ile Asp Phe Phe Asp Ile Met Gly Lys Phe Glu Gln Asn His Ala Met
260 265 270

Gly Thr Leu Leu Gly Ala Met Val Ser Val Asp Phe Lys Asn Val Asn
275 280 285

Lys His Ser Leu Phe Leu Ser Gln Pro Tyr Leu Pro Met Ala Arg Asp
290 295 300

Phe Tyr Val Phe Pro Gln His Thr Lys Met Val Glu Asn Arg Val Ser
305 310 315 320

Leu Ile Asn Ser Val Leu Arg Ser Phe Ala Glu Ala Val Leu Asp Asp
325 330 335

Pro Ser Pro Tyr Leu Asp Leu Met Ser Arg Ser Ala Arg Asp Val Val
Page 19

us seq list.ST25.txt
340 345 350

Lys Leu Glu Met Gln Ile Ala Met Ala Ser Trp Pro Glu Ser Glu Leu
355 360 365

Arg Asn Tyr Ala Gln Gln His Asn Pro Arg Thr Leu Asn Gln Leu Lys
370 375 380

Ala Ala Tyr Pro Ala Ile Lys Trp Asp Ser Tyr Phe Asn Ala Leu Leu
385 390 395 400

Ser Ser Val Gln Gly Val Asp Met Asn Arg Gln Asn Ile Ile Leu Thr
405 410 415

Gln Pro Ser Tyr Phe Gly Trp Leu Asn Ala Leu Phe Asn Gly Gly Ala
420 425 430

Asp Asp Lys Thr Ile Ala Asn Tyr Leu Leu Val His Leu Ile Leu Glu
435 440 445

Glu Ala Asp Phe Leu Gly Gly Ala Leu Lys Thr Met Val Gln Lys Ser
450 455 460

Asp Tyr Val Pro Tyr Ala Leu Gly Arg Gly Lys Gly Val Thr Arg Val
465 470 475 480

Gly Gln Gln Leu Thr Arg Ser His Asp Asp Thr Val Glu Asp Ala Asn
485 490 495

Ile Gln Cys Leu Asn Ser Met Met Thr Tyr Met Pro Phe Gly Pro Gly
500 505 510

Tyr Val Tyr Val Lys Ser Arg Lys Asn Arg Asp Asp Val Val Lys Asp
515 520 525

Ile Glu His Gln Thr Glu Leu Val Phe Lys Asn Phe Val Asn Met Ile
530 535 540

Gly Asn Leu Asn Trp Met Thr Asp Ala Ser Leu Glu Leu Ala Met Glu
545 550 555 560

Lys Ala Asp Thr Met Val Lys Asn Tyr Gly Trp Pro Lys Asp Leu Phe
565 570 575

Gly Asn Phe Arg Asp Ser Ser Lys Ile Asp Ala Tyr His Lys Lys Asp
580 585 590

US seq list.ST25.txt

Tyr Gly Asn Ile Ile Asn Leu Tyr Lys Glu Asn Ile Thr His Asn Tyr
595 600 605

Tyr His Ile Arg Arg Thr Met Ile Lys Gly Tyr Ser Asn His Glu Ser
610 615 620

Leu Arg Leu Leu Thr Glu Ala Pro Lys Arg Asp His Phe Leu Leu Ser
625 630 635 640

Pro Ala Leu Val Asn Ala Trp Tyr Ile Pro Glu Arg Asn Ser Ile Ala
645 650 655

Phe Pro Tyr Ala Phe Trp Asn Pro Pro Tyr Tyr Asn Tyr Glu Tyr Pro
660 665 670

Gln Ala Cys Asn Tyr Ala Gly Gln Gly Gly Thr Ala Gly His Glu Leu
675 680 685

Val His Gly Phe Asp Asp Gln Gly Val Gln Phe Ala Ala Asp Gly Ser
690 695 700

Leu Ser Asp Cys Thr Trp Ile Glu Cys Gly Trp Leu Glu Glu Lys Ser
705 710 715 720

Lys Lys Gly Phe Ser Asp Met Ala Gln Cys Val Val Thr Gln Tyr Ser
725 730 735

Thr Gln Cys Cys Pro Gln Thr Gly Gly Val Thr His Cys Ala Asn Gly
740 745 750

Ala Thr Thr Gln Gly Glu Asn Ile Ala Asp Leu Gly Gly Gln Leu Ala
755 760 765

Ala Tyr Arg Ala Tyr Arg Glu Tyr Ile Thr Lys Glu Arg Gly Glu Glu
770 775 780

Glu Lys Arg Leu Pro Gly Leu Glu Gln Tyr Thr Pro Asn Gln Ile Phe
785 790 795 800

Trp Ile Thr Tyr Gly Tyr Ser Trp Cys Met Ser Gln Thr Asp Ser Ser
805 810 815

Leu Ile Arg Gln Leu Leu Thr Asp Val His Ser Pro Gly Ser Cys Arg
820 825 830

Val Asn Gln Val Met Gln Asp Ile Pro Glu Phe Ala Leu Asp Phe Gly
835 840 845

US seq list.ST25.txt

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Val Trp Val Ala Glu
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 <213> Ancylostoma caninum
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US seq list.ST25.txt

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tccgtcaaaa	gagg	tctatg	tccaaagtcc	agcggttct	gtcgctaact	tttcagcaaa		1680
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<210> 16

<211> 536

<212> PRT

<213> *Ancylostoma caninum*

<400> 16

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35 40 45

Lys Phe Ile Arg Leu Arg Glu Lys Ile Lys Ala Lys Leu Thr Leu Ser
50 55 60

Pro Ala Arg Lys Ala Ile Leu Asp Glu Val Met Lys His Ile Lys Met
65 70 75 80

Ile Lys Lys Asp Lys Ile Gln Glu Lys Gly Asp Ser Ile Asp Glu Ile
85 90 95

Asn Glu Lys Ser Ala Ile Gly Gln Leu Leu Tyr Gln Gly Asp Ile Val
100 105 110

Leu Thr Glu Lys Gln Ala Gln Gln Ile Thr Glu Asp Ile Glu Asn Asp
115 120 125

Lys Gly Asp Arg Glu Lys Arg Gln Ala Phe Arg Asp Arg Asn Tyr Pro
130 135 140

Arg Thr Leu Trp Ser Lys Gly Val Tyr Phe His Phe His Arg Asn Ala
145 150 155 160

Thr Pro Glu Val Arg Ser Val Phe Val Lys Gly Ala Lys Leu Trp Met
165 170 175

Lys Asp Thr Cys Ile Asp Phe Phe Glu Ser Asn Ser Ala Pro Asp Arg
Page 23

us seq list.ST25.txt
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Ile Arg Val Phe Lys Glu Asn Gly Cys Trp Ser Tyr Val Gly Arg Leu
195 200 205

Gly Gly Glu Gln Asp Leu Ser Leu Gly Glu Gly Cys Gln Ser Val Gly
210 215 220

Thr Ala Ala His Glu Ile Gly His Ala Ile Gly Phe Tyr His Thr His
225 230 235 240

Ala Arg His Asp Arg Asp Asn Phe Ile Thr Phe Asn Ala Gln Asn Val
245 250 255

Lys Pro Asp Trp Leu Asp Gln Phe Thr Leu Gln Thr Pro Ala Thr Asn
260 265 270

Glu Asn Tyr Gly Ile Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly
275 280 285

Ala Asn Ser Ala Ser Gln Asn Gly Arg Pro Thr Met Val Pro His Asp
290 295 300

Pro Lys Tyr Val Glu Thr Leu Gly Ile Asn Lys His Tyr Asp Cys Thr
305 310 315 320

Lys Asn Cys Asp Pro Ala Thr Ser Ala Gln Cys Lys Met Gly Gly Phe
325 330 335

Pro His Pro Arg Asp Cys Thr Arg Cys Ile Cys Pro Ser Gly Tyr Gly
340 345 350

Gly Lys Leu Cys Asp Gln Lys Pro Ala Gly Cys Gly Ser Ile Tyr Gln
355 360 365

Ala Thr Asn Gln Tyr Gln Thr Leu His Asp Glu Ile Gly Asp Lys Arg
370 375 380

Ala Gly Gln Arg Pro Arg Glu Asp Met Asp Phe Cys Tyr Tyr Trp Ile
385 390 395 400

Thr Ala Pro Lys Gly Ser Lys Ile Glu Ile Lys Ile Ala Gly Leu Ser
405 410 415

Gln Gly Ala Ala Val Glu Gly Cys Gln Tyr Trp Gly Val Glu Ile Lys
420 425 430

US seq list.ST25.txt

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 450 455 460

Thr Tyr Asn Ile Phe Tyr Ala Thr Tyr Val Asp Ile Gln Tyr Arg Ile
 465 470 475 480

Val Gly Asp Asn Val Gly Gly Pro Met Pro Gln Pro Gln Pro Asn Ser
 485 490 495

Asn Cys Val Asp Asn Glu Gln Cys Ala Thr Leu Val Arg Thr Lys Asn
 500 505 510

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Pro Lys Ser Ser Gly Phe Cys Arg
 530 535

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 <213> Ancylostoma caninum

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US seq list.ST25.txt

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tccaaacgtcc ttaccactgc tttatggaat agacccggca tgcagattgg tcactacacc	1080
cagatggcat gggacaccac ctacaaactt ggatgtgcag ttgtttctg caatgatttc	1140
acattcggtg tttgtcagta tggccagga ggcaattaca tgggtcatgt catctacact	1200
atgggccagc cgtgttctca gtgttcgcct ggtgctactt gcagcgtgac cgaaggctt	1260
tgcagtgctc cttaatcagt tcttaacaat gaatatctt cagttgaaaa aaaaaaaaaa	1320
aaaaaaaaa	1328

<210> 18

<211> 424

<212> PRT

<213> *Ancylostoma caninum*

<400> 18

Met Phe Ser Pro Val Ile Val Ser Val Ile Phe Thr Ile Ala Phe Cys			
1	5	10	15
10	15		

Asp Ala Ser Pro Ala Arg Asp Gly Phe Gly Cys Ser Asn Ser Gly Ile			
20	25	30	
30			

Thr Asp Lys Asp Arg Gln Ala Phe Leu Asp Phe His Asn Asn Ala Arg			
35	40	45	
45			

Arg Arg Val Ala Lys Gly Val Glu Asp Ser Asn Ser Gly Lys Leu Asn			
50	55	60	
60			

Pro Ala Lys Asn Met Tyr Lys Leu Ser Trp Asp Cys Ala Met Glu Gln			
65	70	75	80
75	80		

Gln Leu Gln Asp Ala Ile Gln Ser Cys Pro Ser Ala Phe Ala Gly Ile			
85	90	95	
95			

Gln Gly Val Ala Gln Asn Val Met Ser Trp Ser Ser Ser Gly Gly Phe			
100	105	110	
110			

Pro Asp Pro Ser Val Lys Ile Glu Gln Thr Leu Ser Gly Trp Trp Ser			
115	120	125	
125			

Gly Ala Lys Lys Asn Gly Val Gly Pro Asp Asn Lys Tyr Asn Gly Gly			
130	135	140	
140			

Gly Leu Phe Ala Phe Ser Asn Met Val Tyr Ser Glu Thr Thr Lys Leu			
145	150	155	160
155	160		

US seq list.ST25.txt

Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Leu Ala Val Ser Cys Ile
165 170 175

Tyr Asn Gly Val Gly Tyr Ile Thr Asn Gln Pro Met Trp Glu Thr Gly
180 185 190

Gln Ala Cys Lys Thr Gly Ala Asp Cys Ser Thr Tyr Lys Asn Ser Gly
195 200 205

Cys Glu Asp Gly Leu Cys Thr Lys Gly Pro Asp Val Pro Glu Thr Asn
210 215 220

Gln Gln Cys Pro Ser Asn Thr Gly Met Thr Asp Ser Val Arg Asp Thr
225 230 235 240

Phe Leu Ser Val His Asn Glu Phe Arg Ser Ser Val Ala Arg Gly Leu
245 250 255

Glu Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ala Lys Met Leu
260 265 270

Lys Met Val Tyr Asp Cys Glu Val Glu Ala Ser Ala Ile Arg His Gly
275 280 285

Asn Lys Cys Val Tyr Gln His Ser His Gly Glu Asp Arg Pro Gly Leu
290 295 300

Gly Glu Asn Ile Tyr Lys Thr Ser Val Leu Lys Phe Asp Lys Asn Lys
305 310 315 320

Ala Ala Lys Gln Ala Ser Gln Leu Trp Trp Asn Glu Leu Lys Glu Phe
325 330 335

Gly Val Gly Pro Ser Asn Val Leu Thr Thr Ala Leu Trp Asn Arg Pro
340 345 350

Gly Met Gln Ile Gly His Tyr Thr Gln Met Ala Trp Asp Thr Thr Tyr
355 360 365

Lys Leu Gly Cys Ala Val Val Phe Cys Asn Asp Phe Thr Phe Gly Val
370 375 380

Cys Gln Tyr Gly Pro Gly Gly Asn Tyr Met Gly His Val Ile Tyr Thr
385 390 395 400

Met Gly Gln Pro Cys Ser Gln Cys Ser Pro Gly Ala Thr Cys Ser Val
Page 27

Thr Glu Gly Leu Cys Ser Ala Pro
420

<210> 19
<211> 767
<212> DNA
<213> Ancylostoma caninum

<400> 19
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tcgacgtgca caacagttac agatctatgg ttgccaaagg acaggcaaag gatgcaattt 180
cgggaaatgc tccgaaggct gccaaaatga agaaaatgat ctacgactgc aacgtcgaat 240
caactgcaat gcaaaatgctg aaaaaatgtg ttttcgcccc ttcgcacagg aagggagttg 300
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ctagtgacgg ttggttcagt gagcttgcga agtatgggtg aggccaggaa aacaagctaa 420
caacgcagtt gtggAACAGG ggagttatga taggacatta cactcagatg gtctggcagg 480
agtcctacaa actcggatgt tatgtggaat ggtgttcatc gatgacctat ggtgtctgcc 540
agtacagtcc tcagggtaat atgatgaact cactcatcta cgagaaagga aaccgcgtca 600
caaaagactc tgactgtggc tcgaacgcca gttgcagcgc tggggaggcg ctttgcgtcg 660
tgcgtggcta gctggacatt cccaacgtac aacagcgtta tagttatgc aactttctt 720
tcatcttatt gagtaaaggc attgaaaaca aaaaaaaaaa aaaaaaaaa 767

<210> 20
<211> 218
<212> PRT
<213> Ancylostoma caninum

<400> 20

Met Leu Val Leu Val Pro Leu Leu Ala Leu Leu Ala Val Ser Val His
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Gly Asn Ser Met Arg Cys Gly Asn Asn Gly Met Thr Asp Glu Ala Arg
20 25 30

Gln Lys Phe Leu Asp Val His Asn Ser Tyr Arg Ser Met Val Ala Lys
35 40 45

Gly Gln Ala Lys Asp Ala Ile Ser Gly Asn Ala Pro Lys Ala Ala Lys
50 55 60

US seq list.ST25.txt

Met Lys Lys Met Ile Tyr Asp Cys Asn Val Glu Ser Thr Ala Met Gln
65 70 75 80

Asn Ala Lys Lys Cys Val Phe Ala His Ser His Arg Lys Gly Val Gly
85 90 95

Glu Asn Ile Trp Met Ser Thr Ala Arg Gln Met Asp Lys Ala Gln Ala
100 105 110

Ala Gln Gln Ala Ser Asp Gly Trp Phe Ser Glu Leu Ala Lys Tyr Gly
115 120 125

Val Gly Gln Glu Asn Lys Leu Thr Thr Gln Leu Trp Asn Arg Gly Val
130 135 140

Met Ile Gly His Tyr Thr Gln Met Val Trp Gln Glu Ser Tyr Lys Leu
145 150 155 160

Gly Cys Tyr Val Glu Trp Cys Ser Ser Met Thr Tyr Gly Val Cys Gln
165 170 175

Tyr Ser Pro Gln Gly Asn Asn Met Asn Ser Leu Thr Tyr Glu Lys Gly
180 185 190

Asn Pro Cys Thr Lys Asp Ser Asp Cys Gly Ser Asn Ala Ser Cys Ser
195 200 205

Ala Gly Glu Ala Leu Cys Val Val Arg Gly
210 215

<210> 21

<211> 687

<212> DNA

<213> Ancylostoma caninum

<400> 21

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ccgatgctga ttattccaag tgcccgcaaa atgaaataat gaacaacgat atgagggaaa 120

aagttacgga catgcacaac gcctacagat ccaaattcgc acggatcat caagcttcga 180

aaatgagaaa attggtttac gactgtgcca tcgaaaaagg aatctacgag tcggatacca 240

agtgcgagat gaaaccatcg atggaggagg agaacgtaga agttatcgac ggcaacagcg 300

atgatctcac tggatattca gaggccggta attcgtggtg gagcgagatt ttggacctga 360

aaggaaagga tgtgtacaac tccgtggaca atacatcgga aattgccaat atggcttggg 420

aaagtcatgc gaaacttggc tgccgagttg ttgagtgctc caagaaaaacc catgtagtct 480

gccgatacgg accggaagga aaaggtgaag gaaagaaaat ttacgaaaag ggcgaaacat 540

US seq list.ST25.txt

gctcacaatg cagtgattac ggacaaggtg tcacctgtga caatgacgag tgggagggat	600
tactctgctc ataatatattgg aaaaacatat gtggatgatg atgttcgcaa ataaataaat	660
caattacaaa aaaaaaaaaa aaaaaaaa	687

<210> 22

<211> 200

<212> PRT

<213> Ancylostoma caninum

<400> 22

Met Lys Ser Tyr Leu Val Ile Ser Ala Ala Ile Leu Gly Ile Ala Tyr
1 5 10 15

Ala Asp Ala Asp Tyr Ser Lys Cys Pro Gln Asn Glu Ile Met Asn Asn
20 25 30

Asp Met Arg Glu Lys Val Thr Asp Met His Asn Ala Tyr Arg Ser Lys
35 40 45

Phe Ala Arg Asp His Gln Ala Ser Lys Met Arg Lys Leu Val Tyr Asp
50 55 60

Cys Ala Ile Glu Lys Gly Ile Tyr Glu Ser Asp Thr Lys Cys Glu Met
65 70 75 80

Lys Pro Ser Met Glu Glu Glu Asn Val Glu Val Ile Asp Gly Asn Ser
85 90 95

Asp Asp Leu Thr Val Ile Ser Glu Ala Gly Asn Ser Trp Trp Ser Glu
100 105 110

Ile Leu Asp Leu Lys Gly Lys Asp Val Tyr Asn Ser Val Asp Asn Thr
115 120 125

Asp Glu Ile Ala Asn Met Ala Trp Glu Ser His Ala Lys Leu Gly Cys
130 135 140

Ala Val Val Glu Cys Ser Lys Lys Thr His Val Val Cys Arg Tyr Gly
145 150 155 160

Pro Glu Gly Lys Gly Glu Gly Lys Lys Ile Tyr Glu Lys Gly Glu Thr
165 170 175

Cys Ser Gln Cys Ser Asp Tyr Gly Gln Gly Val Thr Cys Asp Asn Asp
180 185 190

US seq list.ST25.txt

Glu Trp Glu Gly Leu Leu Cys Ser
 195 200

<210> 23
 <211> 1689
 <212> DNA
 <213> Ancylostoma caninum

<400> 23
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 agaatacaat cgacaacaat gttcttaagc cgataaatac tcgtcgagag gctctggca 180
 agggcacgca acagaatggc tttgacccac caaaccacaa aacattttgc ccaccagcga 240
 cggacatgac taaactgagt tggagttgtt atcttgcgtt gaaggctata aaaactatca 300
 acggtaactg tgtgaatccg gcaaaccacaa ccaaaccgaa taacggcgaa ggattggcag 360
 atgtcctcta ctacggcaac gactatgata acacggtcga aggagtgtatc caaggcaatc 420
 tcgaagcttgc gctggtaaaa gccgatttca atgtattttcc ttgttaccaca aaaggttaccg 480
 tcattagcta tcccaacttac aatggcaaca cagatcttttgc ggcatacttca aacttagtcc 540
 ggcctaccaa tactgagata ggtatgttgc tggaaagatg tccagctaca gccaatgttc 600
 caaagctagt cacgttctac tgtatgttgc atggaaaaaa tatcaccacaa ggagaggctc 660
 tctataaggg cacaactgttgc aataccggag gatgcaaaaga ggtcacatgc tcagcggat 720
 atgcctgttgc caacggccacc ttgttatgttgc aacgtatgttgc gacaacaaggc tcatacttacat 780
 cggcaagcac atcttcatca acagtttgc caacaaggc atctatggca ataaggcacat 840
 cttcgtcaac aagcgcacatc gggcaacaa caacaaaaggc tccttctccg caagcgaat 900
 tccccacagg gacttagcact atgtcaata ccaggcatgc ctatgctaacc aggttaccg 960
 acaatcttgcgtt gaaatgttgc acaactttccg aagaggcttgc ctcgcaagg 1020
 gagaaatttcc tcagaagggtt aacatatacc taccaaaggc ggctgacatg tggaaaatttca 1080
 gttacgttgc cggcctggaa caaggagccaa tagaacaacgc aagccatgttgc ctcacaggag 1140
 ggtccggaca aagctcgaga ccaggtgtgg gagagaactt taaaatgtatc ccagcggca 1200
 gatccgttgc ttgttgcgttgc gcaatggccaa caactaacaa ggtgggtgc tctatgttgc 1260
 gtaacgttgc ctacttcggaa aacaacgttca acttccttcccatctatgttgc caagacccgaa 1320
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 tgaacagccaa catctaccaa attggaaatc cctgttgcgttgc gagacctacttca agcgttaccg 1500
 ggtgttgcgttgc agtgcgttgcgttgc ttgttgcgttgc aggttgcgttgc aatgggttgcgttgc 1560
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US seq list.ST25.txt

gttgttaaca agggtggta gattggattg ggaataaatg atgcaatcgc caaaaaaaaaa 1680
aaaaaaaaaa 1689

<210> 24
<211> 508
<212> PRT
<213> Ancylostoma caninum

<400> 24

Met Ile Asn Ile His Phe Ile Ala Leu Ala Ile Thr Ser Leu Leu Pro
1 5 10 15

Ala Leu Ser Glu Gly Lys Pro Val Val Phe Val Glu Pro Gln Cys Lys
20 25 30

Pro Asn Gly Tyr Leu His Lys Asn Thr Ile Asp Asn Asn Val Leu Lys
35 40 45

Pro Ile Asn Thr Arg Arg Glu Ala Leu Ala Lys Gly Thr Gln Gln Asn
50 55 60

Gly Phe Asp Pro Pro Asn Pro Gln Thr Phe Leu Pro Pro Ala Thr Asp
65 70 75 80

Met Thr Lys Leu Ser Trp Ser Cys Asp Leu Glu Gln Lys Ala Ile Lys
85 90 95

Thr Ile Asn Gly Asn Cys Val Asn Pro Ala Asn Pro Thr Lys Pro Asn
100 105 110

Asn Gly Glu Gly Leu Ala Asp Val Leu Tyr Tyr Gly Asn Asp Tyr Asp
115 120 125

Asn Thr Val Glu Gly Val Ile Gln Gly Asn Leu Glu Ala Trp Leu Val
130 135 140

Lys Ala Asp Phe Asn Val Phe Pro Val Thr Thr Lys Gly Thr Val Ile
145 150 155 160

Ser Tyr Pro Thr Tyr Asn Gly Asn Thr Asp Leu Leu Ala Tyr Ser Asn
165 170 175

Leu Val Arg Pro Thr Asn Thr Glu Ile Gly Cys Val Leu Glu Arg Cys
180 185 190

Pro Ala Thr Ala Asn Val Pro Lys Leu Val Thr Phe Tyr Cys Ile Leu
195 200 205

US seq list.ST25.txt

Asn Gly Lys Asn Ile Thr Asn Gly Arg Ala Leu Tyr Lys Gly Thr Thr
210 215 220

Val Asn Thr Gly Gly Cys Lys Glu Val Thr Cys Ser Ala Gly Tyr Ala
225 230 235 240

Cys Asn Asn Ala Thr Leu Leu Cys Glu Arg Ser Ala Thr Thr Ser Ser
245 250 255

Ser Thr Ser Ala Ser Thr Ser Ser Ser Thr Ala Ser Ser Thr Ser Ser
260 265 270

Ser Asn Ala Ile Ser Thr Ser Ser Ser Thr Ser Ala Ser Gly Ala Thr
275 280 285

Thr Thr Lys Ala Pro Ser Pro Gln Ala Gln Phe Pro Thr Gly Thr Ser
290 295 300

Thr Met Cys Asn Thr Arg His Ala Tyr Ala Asn Arg Met Thr Asp Asn
305 310 315 320

Leu Arg Asn Glu Tyr Val Arg Leu His Asn Phe Arg Arg Gly Leu Leu
325 330 335

Ala Lys Gly Glu Ile Pro Gln Lys Gly Asn Ile Tyr Leu Pro Lys Ala
340 345 350

Ala Asp Met Trp Lys Ile Ser Tyr Asp Cys Gly Leu Glu Gln Gly Ala
355 360 365

Ile Glu His Ala Ser Gln Cys Leu Thr Gly Gly Ser Gly Gln Ser Ser
370 375 380

Arg Pro Gly Val Gly Glu Asn Phe Lys Val Ile Pro Ala Ala Arg Phe
385 390 395 400

Pro Thr Phe Glu Asp Ala Ala Lys Lys Thr Val Thr Glu Trp Trp Lys
405 410 415

Pro Ile Arg Asn Val Asp Tyr Phe Gly Asn Asn Val Asn Phe Leu Pro
420 425 430

Ile Tyr Asp Gln Asp Pro Ile Ser Ser Phe Thr Arg Asn Ala Trp Ala
435 440 445

Thr Thr Asn Lys Val Gly Cys Ser Ile Val Lys Cys Thr Thr Asp Asn
Page 33

US seq list.ST25.txt

450

455

460

Val Tyr Val Gly Val Cys Arg Tyr Ser Pro Met Gly Asn Ile Val Asn
 465 470 475 480

Ser Asn Ile Tyr Gln Ile Gly Asn Pro Cys Ser Val Arg Pro Thr Gln
 485 490 495

Ala Thr Gly Cys Asp Pro Val Glu Gly Leu Trp Tyr
 500 505

<210> 25
 <211> 1384
 <212> DNA
 <213> Ancylostoma caninum

<400> 25		
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ctgctgctgt ttctctcgct accaggagcg attcttcaa ccacttgtcc	120	aggaaatgat
ctaacagatg ctgaacgcac actgctaact agggtgacaca attccattcg	180	acgggaaata
gcgcaaggag ttgcaaaca ctaccatggt ggtaaactgc ctgctggaaa	240	gaacatatac
aggatgagat acagctgtga gctggaacag gctgctattt atgctagtca	300	aaccttctgt
tccgcacatcat tggaggaacc acagaaatat ggacaaaaca tccaagcata	360	cgtcacacca
tctataatcg ctcgcccggaa aaacgacctt cttgaagatg cagtgaaaca	420	atggtatctg
cctgttatct actacggcca gcgcgacgcg gccaacaagt ttacggatcc	480	gcccgtac
acatttgcaa acctcgccctt cgacaagaac actgcacttg gctgtcacta	540	tgcgaaatgt
caaggccctg acagaatcgt cattagttgc atgtacaaca acgtcggtcc	600	tgacaacgca
gtgatctacg agcctggaac tgcttgcgtt aaagatgcgg actgcactac	660	ttatcctcag
tccacatgca aggacagcct ttgcattatt cctacgcccac atccaccaaa	720	ccaccatgca
ccaccaccag caatgagtc aaacgctgaa atgactgatg cagcacgaaa	780	aaacgctgca
ggcatgcaca actggcgcag atcgcaggc gctctggaa acgttcaaaa	840	atcgcaggc
gcttacaact gccccactgc aacagacatg tacaagatag aatatgattt	900	atcgcaggc
aacagcgctc tagcgtatgc aaagcaatgt agtctcggtt gttcagcaga	960	atcgcaggc
ccaggagaag gcgagaatgt ccacaaaggc gctctcgtaa ccgatccgga	1020	atcgcaggc
cagaccgcag ttcaagcatg gtggagtc当地 atctcacaat atggactcaa	1080	atcgcaggc
aaattcactg ctttcttcaa ggacaaggct gacgctccga cagcgtttac	1140	atcgcaggc
tgccc当地 ccgtaaagct tggatgtgct gtctctaatt gtcaggcaga taccttacc	1200	atcgcaggc
gtctgttagat acaaagctgc cgaaaacatc gtggcgaat tcatctatac	1260	caaggaaat

US seq list.ST25.txt

gtatgcgacg	cctgtaaagc	cacatgcatt	accgcggaag	gtcttgccc	aacgccttga	1320
ttttcactgg	actgtttcac	gaacagatca	gataaatcgt	ttcatcaaaa	aaaaaaaaaa	1380
aaaaa						1384

<210> 26

<211> 424

<212> PRT

<213> *Ancylostoma caninum*

<400> 26

Met Pro Asn Leu Leu Leu Leu Leu Phe Leu Ser Leu Pro Gly Ala Ile
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Leu Ser Thr Thr Cys Pro Gly Asn Asp Leu Thr Asp Ala Glu Arg Thr
20 25 30

Leu Leu Thr Arg Val His Asn Ser Ile Arg Arg Glu Ile Ala Gln Gly
35 40 45

Val Ala Asn Asn Tyr His Gly Gly Lys Leu Pro Ala Gly Lys Asn Ile
50 55 60

Tyr Arg Met Arg Tyr Ser Cys Glu Leu Glu Gln Ala Ala Ile Asp Ala
65 70 75 80

Ser Gln Thr Phe Cys Ser Ala Ser Leu Glu Glu Pro Gln Lys Tyr Gly
85 90 95

Gln Asn Ile Gln Ala Tyr Val Thr Pro Ser Ile Ile Ala Arg Pro Lys
100 105 110

Asn Asp Leu Leu Glu Asp Ala Val Lys Gln Trp Tyr Leu Pro Val Ile
115 120 125

Tyr Tyr Gly Gln Arg Asp Ala Ala Asn Lys Phe Thr Asp Pro Arg Leu
130 135 140

Tyr Thr Phe Ala Asn Leu Ala Tyr Asp Lys Asn Thr Ala Leu Gly Cys
145 150 155 160

His Tyr Ala Lys Cys Gln Gly Pro Asp Arg Ile Val Ile Ser Cys Met
165 170 175

Tyr Asn Asn Val Val Pro Asp Asn Ala Val Ile Tyr Glu Pro Gly Thr
180 185 190

Ala Cys Val Lys Asp Ala Asp Cys Thr Thr Tyr Pro Gln Ser Thr Cys
Page 35

195 200 US seq list.ST25.txt 205

Lys Asp Ser Leu Cys Ile Ile Pro Thr Pro His Pro Pro Asn Pro Pro
210 215 220

Asn Pro Pro Pro Ala Met Ser Pro Asn Ala Glu Met Thr Asp Ala Ala
225 230 235 240

Arg Lys Lys Val Leu Gly Met His Asn Trp Arg Arg Ser Gln Val Ala
245 250 255

Leu Gly Asn Val Gln Asn Gly Lys Asn Ala Tyr Asn Cys Pro Thr Ala
260 265 270

Thr Asp Met Tyr Lys Ile Glu Tyr Asp Cys Asp Leu Glu Asn Ser Ala
275 280 285

Leu Ala Tyr Ala Lys Gln Cys Ser Leu Val Gly Ser Ala Glu Gly Thr
290 295 300

Arg Pro Gly Glu Gly Glu Asn Val His Lys Gly Ala Leu Val Thr Asp
305 310 315 320

Pro Glu Ala Ala Val Gln Thr Ala Val Gln Ala Trp Trp Ser Gln Ile
325 330 335

Ser Gln Asn Gly Leu Asn Ala Gln Met Lys Phe Thr Ala Phe Leu Lys
340 345 350

Asp Lys Pro Asp Ala Pro Thr Ala Phe Thr Gln Met Ala Trp Ala Lys
355 360 365

Ser Val Lys Leu Gly Cys Ala Val Ser Asn Cys Gln Ala Asp Thr Phe
370 375 380

Thr Val Cys Arg Tyr Lys Ala Ala Gly Asn Ile Val Gly Glu Phe Ile
385 390 395 400

Tyr Thr Lys Gly Asn Val Cys Asp Ala Cys Lys Ala Thr Cys Ile Thr
405 410 415

Ala Glu Gly Leu Cys Pro Thr Pro
420

<210> 27
<211> 1467
<212> DNA
<213> Ancylostoma caninum

US seq list.ST25.txt

<400> 27
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caaatccatt aacaacctaa ggaagaaaat cgccgatgga tcagcgaaa acaaatcagg 180
aaagtgcggc cagggcaaga atatctacaa gctaagctgg gattgtgaat tggaaactgaa 240
agcacagcaa gctgttagacc agtgcaacc gaatgtaccc gaacccgcag gatattcgca 300
aatactaaag aaggtaaaa gcacctgcga cccaacgaag gtcctgaaga aacagataga 360
agcatggtgg actaagtccg taaaagatgc tggagtttat aatcctccaa acaacaaaca 420
aggttggaa gatttcgcaa agtagcaaa tggaaaggct acgaagattg gttgtgcgca 480
aaaaaactgc aacgaacagt tgtacgtggc atgtgttatt aacgaaccgg ctccctgcagt 540
gggtatgcca atctatgagg ttggagctgg atgtaattcc aaagacgattt gtacaacgta 600
tctgcagtcg aagtgcagta acaaagtatg cgtcgcccgg cacccaggtg atgccaccac 660
tacaacatca acaccagcaa caacagcacc aacaacaccc acgattcctg ctggaccaac 720
aactgcgcca gctccaccac caacaactgc agtcctaca acgacgagta cgattggttc 780
gattgacaat acgatttgcg cgcacccca agtgatcacc gactcagtca ggctcacatt 840
cttgaatacg cacaacggac tcagatctca actcgcgca ggtcaatct ttatggaaa 900
tggcgctagg ggcgcgtccgg catcgaaaat gaggaggatg gtatataact gtgatgcgga 960
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aaggaatatg tactctctga gcgttggaaat accaaacttc gctaaaatgg cttggaaac 1200
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atatatcttt ggggagataa ttttacgagc aataaaccaa gcgtgaagaa aaaaaaaaaaa 1440
aaaaaaaaaaa aaaaaaaaaaa aaaaaaaaaaa 1467

<210> 28
<211> 451
<212> PRT
<213> *Ancylostoma caninum*

<400> 28

Met Lys Leu Phe Ile Leu Val Leu Val Ala Ile Leu Gly Ile Ala His
1 5 10 15

US seq list.ST25.txt

Ala Thr Asp Phe Gln Cys Trp Asn Phe Lys Ser Thr Asp Thr Leu Arg
20 25 30

Glu His Tyr Leu Lys Ser Ile Asn Asn Leu Arg Lys Lys Ile Ala Asp
35 40 45

Gly Ser Ala Glu Asn Lys Ser Gly Lys Cys Pro Gln Gly Lys Asn Ile
50 55 60

Tyr Lys Leu Ser Trp Asp Cys Glu Leu Glu Leu Lys Ala Gln Gln Ala
65 70 75 80

Val Asp Gln Cys Lys Pro Asn Val Pro Glu Pro Ala Gly Tyr Ser Gln
85 90 95

Ile Leu Lys Lys Val Lys Ser Thr Cys Asp Pro Thr Lys Val Leu Lys
100 105 110

Lys Gln Ile Glu Ala Trp Trp Thr Lys Ser Val Lys Asp Ala Gly Val
115 120 125

Asp Asn Pro Pro Asn Asn Lys Gln Gly Leu Glu Asp Phe Ala Lys Leu
130 135 140

Ala Asn Gly Lys Ala Thr Lys Ile Gly Cys Ala Gln Lys Asn Cys Asn
145 150 155 160

Glu Gln Leu Tyr Val Ala Cys Val Ile Asn Glu Pro Ala Pro Ala Val
165 170 175

Gly Met Pro Ile Tyr Glu Val Gly Ala Gly Cys Asn Ser Lys Asp Asp
180 185 190

Cys Thr Thr Tyr Leu Gln Ser Lys Cys Ser Asn Lys Val Cys Val Ala
195 200 205

Gly His Pro Gly Asp Ala Thr Thr Thr Ser Thr Pro Ala Thr Thr
210 215 220

Ala Pro Thr Thr Pro Thr Ile Pro Ala Gly Pro Thr Thr Ala Pro Ala
225 230 235 240

Pro Pro Pro Thr Thr Ala Ala Pro Thr Thr Ser Thr Ile Gly Ser
245 250 255

Ile Asp Asn Thr Ile Cys Pro Gln Asn Gln Val Ile Thr Asp Ser Val
260 265 270

US seq list.ST25.txt

Arg Leu Thr Phe Leu Asn Thr His Asn Gly Leu Arg Ser Gln Leu Ala
275 280 285

Gln Gly Gln Ile Phe Met Gly Asn Gly Ala Arg Ala Arg Pro Ala Ser
290 295 300

Lys Met Arg Arg Met Val Tyr Asn Cys Asp Ala Glu Ser Ser Ala Arg
305 310 315 320

Asn Ser Ala Ala Gln Cys Leu Ser Ser Pro Gly Ser Pro Ser Gly Tyr
325 330 335

Thr Glu Asn Leu His Val Ile Asn Asn Asn Phe Val Asp His Asn Ser
340 345 350

Ala Ala Thr Gln Ala Phe Asn Ala Trp Trp Ser Glu Ile Asn Thr Gly
355 360 365

Tyr Met Arg Gln Ala Glu Thr Glu Arg Asn Met Tyr Ser Leu Ser Val
370 375 380

Gly Ile Pro Asn Phe Ala Lys Met Ala Trp Glu Thr Asn Ala His Leu
385 390 395 400

Gly Cys Ala Ile Val Arg Cys Gly Leu Asn Thr Asn Val Val Cys Pro
405 410 415

Tyr Ser Pro Lys Ser Asp Gly Gly Gln Ile Tyr Lys Met Gly Pro Phe
420 425 430

Cys Arg Arg Cys Pro Asp Tyr Pro Gly Thr Phe Cys Asn Gln Gly Leu
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<211> 602

<212> DNA

<213> Ancylostoma caninum

<400> 29

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US seq list.ST25.txt

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<210> 30

<211> 144

<212> PRT

<213> Ancylostoma caninum

<400> 30

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Pro Ala Ala Asn Val Arg Val Lys Leu Trp Glu Glu Asp Thr Gly Pro
35 40 45

Asp Pro Asp Asp Leu Leu Asp Ala Gly Tyr Thr Asn Ser Asn Gly Glu
50 55 60

Phe Gln Leu Gln Gly Gly Thr Ile Glu Thr Thr Pro Ile Asp Pro Val
65 70 75 80

Leu Lys Ile Tyr His Asp Cys Asn Asp Val Thr Gly Phe Leu Ser Val
85 90 95

Pro Lys Pro Gly Ser Arg Lys Val Arg Phe Ser Leu Pro Asp Lys Tyr
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Ile Ser Asp Gly Met Val Pro Lys Lys Val Met Asp Ile Gly Val Ile
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Asn Leu Glu Val Glu Phe Glu Lys Glu Gly Arg Glu Phe Ile Val Asp
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<213> Ancylostoma caninum

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<210> 32

<211> 162

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<213> *Ancylostoma caninum*

<400> 32

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 35 40 45

Asn Gln Ser Glu Leu Glu Lys Asn Ile Asn Arg Val Lys Asp Leu Leu
 50 55 60

Thr Ala Val Lys Glu Lys Ala Lys Met Leu Glu Pro Met Ala Asn Asp
 65 70 75 80

Ala Gln Lys Lys Thr Leu Ser Gln Val Asp Asn Tyr Leu Asn Glu Val
 85 90 95

Gln Gln Phe Gly Glu Gln Val Ser Lys Glu Gly Ser Ala Lys Phe Glu
 Page 41

US seq list.ST25.txt

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 Glu Asn Lys Gly Lys Trp Gln Gln Met Leu Asn Asp Ile Phe Glu Lys
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Gly Gly Leu Asp Gly Val Leu Lys Leu Leu Asn Leu Lys Ser Ala Gly
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Thr Arg

<210> 33
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 <213> Ancylostoma caninum

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US seq list.ST25.txt

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<210> 34

<211> 647

<212> PRT

<213> *Ancylostoma caninum*

<400> 34

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 20 25 30

Gln Val Leu Pro Thr Asp Glu Ser Gly Asn Tyr Ile Tyr Pro Val Val
 35 40 45

Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu His Lys Arg Pro Ile
 50 55 60

His Pro Val Leu Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu Ser
 65 70 75 80

Gly His Pro Leu Gly Glu Asp Gly Gln Pro Leu Pro Thr Asp Ala Ser
 85 90 95

US seq list.ST25.txt

Gly Val Pro Val Asp Lys Asp Gly Gln Pro Leu Pro Thr Asp Ser Ser
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Gly His Tyr Val Thr Val Pro Arg Glu Glu Ala Val Thr Lys Glu Leu
115 120 125

Pro Thr Asp Glu Ser Gly Asn Val Ile Tyr Pro Val Thr Lys Pro Asp
130 135 140

Gly Ser Pro Leu Pro Thr Asp Ala Ser Gly Asn Tyr Val Thr Asp Glu
145 150 155 160

Gly Thr Val Ile Glu Lys Asp Asp Glu Gly Arg Pro Leu Gly Pro Asp
165 170 175

Gly Gln Val Leu Pro Thr Asp Glu Ser Gly Asn Tyr Ile Tyr Pro Val
180 185 190

Val Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu Tyr Lys Arg Pro
195 200 205

Ile His Pro Val Leu Gly Pro Asp Gly Ser Pro Leu Pro Thr Asp Glu
210 215 220

Ser Gly His Pro Leu Gly Glu Asp Gly Gln Pro Leu Pro Thr Asp Ala
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Ser Gly Val Pro Val Asp Lys Asp Gly Gln Pro Leu Pro Thr Asp Ser
245 250 255

Ser Gly His Tyr Val Thr Val Pro Arg Glu Glu Ala Val Thr Lys Glu
260 265 270

Leu Pro Thr Asp Glu Ser Gly Asn Val Ile Tyr Pro Val Thr Lys Pro
275 280 285

Asp Gly Ser Pro Leu Pro Thr Asp Ala Ser Gly Asn Phe Ile Thr Glu
290 295 300

Glu Gly Leu Ile Ile Gly Pro Asp Gly Val Ala Leu Pro Tyr Pro Arg
305 310 315 320

Asn Arg Thr Cys Ser Leu Lys Gln Leu Lys Met Asp Ile Leu Phe Ala
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Val Ser Thr Thr Lys Val Ser Lys Ser Thr Phe Asp Ser Ile Leu Arg
340 345 350

US seq list.ST25.txt

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385 390 395 400

Ile Glu Phe Ser Asp Asp Gly Ser Gln Asp Tyr Ile Ser Leu Tyr Gly
405 410 415

Pro Ala Lys Gln Gln Phe Val Met Phe Pro Arg Ala Asp Ser Ala Lys
420 425 430

Ile Ala Ile Phe Leu Ile Gln Asp Glu Ile Ser Tyr Cys Leu Ser Thr
435 440 445

Arg Thr Leu Arg Cys Gly Cys Ala Thr Ala Val Asp Ser Asp Phe Cys
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Arg Arg Ile Asn Asn Val Leu Ala Asp Asp Ile Lys Val Cys Lys Val
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Pro Glu Thr Ala Val Val Pro Thr Pro Val Val His Pro Gln Gly Ser
485 490 495

Arg Ala Val Ser Val Val Val Pro Arg Phe Phe Ser Ala Pro Pro Phe
500 505 510

Asp Thr His Ser Pro Ser Arg Leu Thr Leu Leu Ala Asp Phe Ala Thr
515 520 525

Glu Lys Glu Pro Leu Cys Gly Glu His Ser Phe Leu Ser Pro Gln Lys
530 535 540

Trp Gly Lys Asn His Cys Thr Leu Arg Ile Pro Leu Ser Met Pro Gly
545 550 555 560

Ile Asp His Lys Ser Asp Asp His Tyr Tyr Tyr Asp Asp Gln Thr Pro
565 570 575

Leu Glu Ser Glu Tyr Ser Leu Asp Leu Phe Gly Lys Ala Glu Leu Val
580 585 590

Arg Phe Phe Val Gln Val Asn Val Glu Arg Glu Leu Asp Leu Ala Pro
Page 45

595 600 605
US seq list.ST25.txt

Glu Thr Val Arg Phe Ser Ser Leu Leu Arg Ser Asn Ala Ala Tyr Tyr
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Lys Ser Pro Gly Ser Arg Pro Asn Asn Ser Asn Ser Ala Thr Lys Arg
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<212> DNA
<213> Ancylostoma caninum

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<210> 36
<211> 382
<212> PRT
<213> Ancylostoma caninum

<400> 36

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35 40 45

Val Thr Gln Val Leu Ala Asp Leu Ser Thr Val Phe Gly Asp Thr Lys
50 55 60

Ile Ala Gln Gly Glu Gly His His Ser Arg Ile Gly Val Val Thr Tyr
65 70 75 80

Gly Leu Asn Ala Glu Thr Arg Tyr Asn Leu Thr Asp Phe Lys Ser Thr
85 90 95

Asp Asp Met Leu Glu Ala Ile Trp Asp Ile Lys Cys Ser Asp Asp Lys
100 105 110

Tyr Ser Asn Leu Phe Ala Gly Leu Thr Arg Thr Gln Glu Ile Met Lys
115 120 125

Asn Gly Arg Gln Gly Arg Leu Arg Ala Asn Val Arg Ser Ala Ile Ile
130 135 140

Ile Tyr Ala Ser Asp Phe Arg Glu Gly Asp Val Asn Asp Ala Val Gln
145 150 155 160

Leu Ala His Gln Ile Lys Ile Gly Gly Thr Asp Ile Ile Val Val Ala
165 170 175

Phe Asp Gln Lys Gly Lys Val Asn Ala Leu Glu Gly Leu Gln Lys Ile
180 185 190

Ala Ser Pro Gly Arg Leu Phe Lys Ser Thr Thr Lys Asn Leu Val Gly
195 200 205

Leu Ile Gln Asp Ala Leu Cys Gln Thr Asn Cys Phe Cys Lys Lys Leu
Page 47

US seq list.ST25.txt

210

215

220

Trp Thr Gln Tyr Gly Asp Gly Ser Val Lys Tyr Gly Glu Cys Leu Arg
 225 230 235 240

Ile Gly Gly Ile Asp Ala Asn Trp Leu Ala Ala Lys Lys Ala Cys Gln
 245 250 255

Arg Leu Ile Pro Gly Gly His Leu Ala Thr Glu Leu Asp Ser Tyr Lys
 260 265 270

His Asp Phe Ile Ala Arg Met Phe Lys Asp Asp Tyr Arg His Glu Pro
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Pro Tyr Met Tyr His Ile Gly Leu Ser Phe Asp Lys Gln Lys Asn Asp
 290 295 300

Tyr Phe Trp Glu Gln Pro Lys Asp Arg Met Pro Leu Pro Leu Lys Asp
 305 310 315 320

Ser Pro Phe Arg Tyr Trp Ser Arg Gly Phe Pro Asn Pro Arg Glu Lys
 325 330 335

Asp Thr Cys Val Leu Ala Ala Gln Thr Thr Ile Leu Ser Pro Glu Ile
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<210> 37

<211> 892

<212> DNA

<213> Ancylostoma caninum

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US seq list.ST25.txt

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<210> 38
<211> 228
<212> PRT
<213> *Ancylostoma caninum*

<400> 38

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35 40 45

Asn Gly Phe Arg Val Arg Glu Ile Thr Pro Ser Glu Gln Gln Glu Leu
50 55 60

Val Lys Tyr Gln Asn Asp Val Ala Glu Tyr Lys Thr Ala Leu Lys Gln
65 70 75 80

Ala Ile Lys Glu Arg Glu Glu Lys Ile Arg Ala Arg Leu Ala Gly Lys
85 90 95

Lys Val Lys Ala Val Glu Ser Thr Asn Gln Glu Asp Leu Pro Lys Pro
100 105 110

Pro Gln Lys Pro Ser Phe Cys Thr Pro Glu Asp Thr Thr Gln Phe Phe
115 120 125

Phe Glu Gly Cys Met Ile Gln Asn Asn Lys Ile Tyr Val Gly Asn Thr
130 135 140

Phe Ala Arg Asp Leu Thr Gln Pro Glu Ile Ser Glu Leu Lys Glu Phe
145 150 155 160

US seq list.ST25.txt

Glu Lys Lys Phe Lys Val Tyr Gln Asp Tyr Val Gln Lys Gln Ala Glu
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Gln Gln Val Asn Ser Leu Phe Gly Gly Ser Asp Phe Phe Ser Ala Leu
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Phe Ser Gly Gly Glu Thr Ser Lys Pro Ser Thr Thr Thr Val Ala Pro
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Thr Arg Ile Ile
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<210> 39
<211> 1722
<212> DNA
<213> Ancylostoma caninum

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US seq list.ST25.txt

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caatggaata	aatgttgcac	cataaaaaaa	aaaaaaa	aaaaaaa	aa	1722

<210> 40

<211> 536

<212> PRT

<213> Ancylostoma caninum

<400> 40

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Gly Phe Leu Asp Thr Lys Phe Gly Gln Lys Ile Lys Lys Thr Leu Asp
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Lys Ile Lys Ala Val Leu Asn Gly Thr Ala Leu Ile Ala Ile Arg Glu
 35 40 45

Lys Phe Ile Arg Leu Arg Glu Lys Ile Lys Ala Lys Leu Thr Leu Ser
 50 55 60

Pro Ala Arg Lys Ala Ile Leu Asp Glu Val Met Lys His Ile Lys Met
 65 70 75 80

Ile Lys Lys Asp Lys Ile Gln Glu Lys Gly Asp Ser Ile Asp Glu Ile
 85 89 95

Asn Glu Lys Ser Ala Ile Gly Gln Leu Leu Tyr Gln Gly Asp Ile Val
 100 105 110

Leu Thr Glu Lys Gln Ala Gln Gln Ile Thr Glu Asp Ile Glu Asn Asp
 115 120 125

Lys Gly Asp Arg Glu Lys Arg Gln Ala Phe Arg Asp Arg Asn Tyr Pro
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US seq list.ST25.txt

130 135 140
Arg Thr Leu Trp Ser Lys Gly Val Tyr Phe His Phe His Arg Asn Ala
145 150 155 160
Thr Pro Glu Val Arg Ser Val Phe Val Lys Gly Ala Lys Leu Trp Met
165 170 175
Lys Asp Thr Cys Ile Asp Phe Phe Glu Ser Asn Ser Ala Pro Asp Arg
180 185 190
Ile Arg Val Phe Lys Glu Asn Gly Cys Trp Ser Tyr Val Gly Arg Leu
195 200 205
Gly Gly Glu Gln Asp Leu Ser Leu Gly Glu Gly Cys Gln Ser Val Gly
210 215 220
Thr Ala Ala His Glu Ile Gly His Ala Ile Gly Phe Tyr His Thr His
225 230 235 240
Ala Arg His Asp Arg Asp Asn Phe Ile Thr Phe Asn Ala Gln Asn Val
245 250 255
Lys Pro Asp Trp Leu Asp Gln Phe Thr Leu Gln Thr Pro Ala Thr Asn
260 265 270
Glu Asn Tyr Gly Ile Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly
275 280 285
Ala Asn Ser Ala Ser Gln Asn Gly Arg Pro Thr Met Val Pro His Asp
290 295 300
Pro Lys Tyr Val Glu Thr Leu Gly Ile Asn Lys His Tyr Asp Cys Thr
305 310 315 320
Lys Asn Cys Asp Pro Ala Thr Ser Ala Gln Cys Lys Met Gly Gly Phe
325 330 335
Pro His Pro Arg Asp Cys Thr Arg Cys Ile Cys Pro Ser Gly Tyr Gly
340 345 350
Gly Lys Leu Cys Asp Gln Lys Pro Ala Gly Cys Gly Ser Ile Tyr Gln
355 360 365
Ala Thr Asn Gln Tyr Gln Thr Leu His Asp Glu Ile Gly Asp Lys Arg
370 375 380

US seq list.ST25.txt

Ala Gly Gln Arg Pro Arg Glu Asp Met Asp Phe Cys Tyr Tyr Trp Ile
 385 390 395 400

Thr Ala Pro Lys Gly Ser Lys Ile Glu Ile Lys Ile Ala Gly Leu Ser
 405 410 415

Gln Gly Ala Ala Val Glu Gly Cys Gln Tyr Trp Gly Val Glu Ile Lys
 420 425 430

Thr His Ala Asp Gln Arg Leu Thr Gly Tyr Arg Phe Cys Ala Pro Glu
 435 440 445

Asp Val Gly Val Arg Leu Val Ser Asn Phe Asn Ile Val Pro Ile Ile
 450 455 460

Thr Tyr Asn Ile Phe Tyr Ala Thr Tyr Val Asp Ile Gln Tyr Arg Ile
 465 470 475 480

Val Gly Asp Asn Val Gly Gly Pro Met Pro Gln Pro Gln Pro Asn Ser
 485 490 495

Asn Cys Val Asp Asn Glu Gln Cys Ala Thr Leu Val Arg Thr Lys Asn
 500 505 510

Phe Cys Gln Ser Arg Phe Phe Thr Ser Ser Val Lys Arg Gly Leu Cys
 515 520 525

Pro Lys Ser Ser Gly Phe Cys Arg
 530 535

<210> 41
 <211> 850
 <212> DNA
 <213> Ancylostoma caninum

<400> 41
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 ggtcaatgct gatgaggaag acgatctacc ccgcaatcct ttgtgggacg cttacaagga 120
 tgacaatggc aaatatgtga ttccgtacgt cattaacgga agttatggag aggagaaaaa 180
 agttttatgg gaaatgatgg acgaaatcga taagaatacc tgcgtccgct tcataccag 240
 atcgacagag caggattata tcgaaatcgt aaacagacta ggagaaggaa ccggcgctgt 300
 tgttaggtaaa cctggagggaa aaagcatcgt gttgttgaa tcgagcaaaa ttctaaatga 360
 tccaaactcct gcgcctgtaa tgcagacttt gatgaaaatc attggcttac cacctgaaca 420
 cattcgacca gagagggaaag atcatatcaa gatacactgg gagaacatcg agaaaggta 480
 cgaagcttcc ttgcgcctct cctctgttaa gcccgtccg tacggaatac catatgatta 540

us seq list.ST25.txt

ctactccatc atgcactaca agaaggacgc	ctttgccaag ccgggcacga	tcacaatgga	600
aactttggat aagcgctacc	aggatatcat tggaatcaa	gagaagccgt cgaagttgga	660
ttacaagaag atctgcacca	agtataaatg cgatatctgc	atgggtgaga agatgaagta	720
ttaaagaaaag gaatgacgtt	aacataagga atggttgccg	atttcaacaa aacgaacgtc	780
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aaaaaaaaaa			850

<210> 42
<211> 233
<212> PRT
<213> *Ancylostoma caninum*

<400> 42

Met Lys Tyr Phe Val Leu Cys Phe Cys Ala Phe Phe Val Val Asn Ala
1 5 10 15

Asp Glu Glu Asp Asp Leu Pro Arg Asn Pro Leu Trp Asp Ala Tyr Lys
20 25 30

Asp Asp Asn Gly Lys Tyr Val Ile Pro Tyr Val Ile Asn Gly Ser Tyr
35 40 45

Gly Glu Glu Lys Lys Val Leu Phe Glu Met Met Asp Glu Ile Asp Lys
50 55 60

Asn Thr Cys Val Arg Phe Ile Pro Arg Ser Thr Glu Gln Asp Tyr Ile
65 70 75 80

Glu Ile Val Asn Arg Leu Gly Glu Gly Thr Gly Ala Val Val Gly Lys
85 90 95

Pro Gly Gly Lys Ser Ile Val Leu Leu Glu Ser Ser Lys Ile Leu Asn
100 105 110

Asp Pro Thr Pro Ala Pro Val Met Gln Thr Leu Met Lys Ile Ile Gly
115 120 125

Leu Pro Pro Glu His Ile Arg Pro Glu Arg Lys Asp His Ile Lys Ile
130 135 140

His Trp Glu Asn Ile Glu Lys Gly Tyr Glu Ala Phe Phe Ala Leu Ser
145 150 155 160

Ser Val Lys Pro Asp Pro Tyr Gly Ile Pro Tyr Asp Tyr Tyr Ser Ile
165 170 175

US seq list.ST25.txt

Met His Tyr Lys Lys Asp Ala Phe Ala Lys Pro Gly Thr Ile Thr Met
 180 185 190

Glu Thr Leu Asp Lys Arg Tyr Gln Asp Ile Ile Gly Asn Gln Glu Lys
 195 200 205

Pro Ser Lys Leu Asp Tyr Lys Lys Ile Cys Thr Lys Tyr Lys Cys Asp
 210 215 220

Ile Cys Met Gly Glu Lys Met Lys Tyr
 225 230

<210> 43
 <211> 1168
 <212> DNA
 <213> *Ancylostoma caninum*

<400> 43
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 tcaccgcccgt tcacacgggt tcagcaaggg gaagaccat caacattttc gagcaaaaagg 120
 aaggaggaga catcacacag ctgagagaaa aagggagcgc aatgttcaac gcccatttca 180
 gaacgtcgag tctgaagtgg aacaagaggg attcagacgg gaattttgtc ataccgtaca 240
 taattacagg acgctatgac cgaacggagc gggaaatatc aaggaagcaa tgaggcgc 300
 catcgaggcaat acgtgttattc gtttcaagca aagagactat gagagagact atatcgagat 360
 ccagaacaaa gctggacatg gatgttacac caatgtcggt cgtgtcggt gcagaagtat 420
 actgtatgctc gagtccagct tcgagggaaac atgcatggag acagaaatcg tgctgcacga 480
 gttgatgcac gttgtcggtc tgtggcacga acacatgcgc cacgatcgatgc acaaatacat 540
 caaagtgcac tacgagaaca tcgaaaaggag ttactggaaac caattcgaga aagtctcacc 600
 gatggaagct accacgtata acgtaccgta tgactacaaa tccgtcatgc actacgagaa 660
 gtcggcattc gccagacccgt gacgaatcag catggaaacg cttgatccca aatatcgaa 720
 cgtcatcgga caccagaagg acgcctctcc cagtgactac cgtaagatct gcgagatata 780
 ccagtgttaag aagtgcacatg acggcaagat cgagatcgga ggcgactcgg actccaaaccc 840
 gaaaccgcca accgaggccc cagtcacccat cagaccggcg ccagaaatca acggagaatg 900
 ccgcgatatg atcccgatctt tctgccgagc gttggccgc tcgcacatga tcgactcgat 960
 cttcttccat aaacaacaat gctgtcaac ctgcgccgag ttagggcaca gggatcagga 1020
 ccagggagga tggttagaac aaacaggatg gccattcgac gggctttcc gaatattcg 1080
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 atttgcacaaa taaaaaaaaaaaaaaa 1168

US seq list.ST25.txt

<210> 44
<211> 366
<212> PRT
<213> Ancylostoma caninum

<400> 44

Met Ala Thr Met Leu Ala Val Cys Arg Leu Val Val Phe Leu Thr Ala
1 5 10 15

Val His Thr Val Ser Ala Arg Gly Arg Pro Ile Asn Ile Phe Glu Gln
20 25 30

Lys Glu Gly Gly Asp Ile Thr Gln Leu Arg Glu Lys Gly Ser Ala Met
35 40 45

Phe Asn Ala Leu His Arg Thr Ser Ser Leu Lys Trp Asn Lys Arg Asp
50 55 60

Ser Asp Gly Asn Phe Val Ile Pro Tyr Ile Ile Thr Gly Arg Tyr Asp
65 70 75 80

Arg Thr Glu Arg Gly Thr Ile Lys Glu Ala Asn Arg Arg Ile Glu Ala
85 90 95

Asn Thr Cys Ile Arg Phe Lys Gln Arg Asp Tyr Glu Arg Asp Tyr Ile
100 105 110

Glu Ile Gln Asn Lys Ala Gly His Gly Cys Tyr Thr Asn Val Gly Arg
115 120 125

Val Gly Gly Arg Ser Ile Leu Met Leu Glu Ser Ser Phe Glu Glu Thr
130 135 140

Cys Met Glu Thr Glu Ile Val Leu His Glu Leu Met His Val Val Gly
145 150 155 160

Leu Trp His Glu His Met Arg His Asp Arg Asp Lys Tyr Ile Lys Val
165 170 175

His Tyr Glu Asn Ile Glu Arg Ser Tyr Trp Asn Gln Phe Glu Lys Val
180 185 190

Ser Pro Met Glu Ala Thr Thr Tyr Asn Val Pro Tyr Asp Tyr Lys Ser
195 200 205

Val Met His Tyr Glu Lys Ser Ala Phe Ala Arg Pro Gly Arg Ile Ser
210 215 220

US seq list.ST25.txt

Met Glu Thr Leu Asp Pro Lys Tyr Gln Asn Val Ile Gly His Gln Lys
225 230 235 240

Asp Ala Ser Pro Ser Asp Tyr Arg Lys Ile Cys Glu Ile Tyr Gln Cys
245 250 255

Lys Lys Cys Met Asn Gly Lys Ile Glu Ile Gly Gly Asp Ser Asp Ser
260 265 270

Asn Pro Lys Pro Pro Thr Glu Ala Pro Val Thr Ile Arg Pro Ala Pro
275 280 285

Glu Ile Asn Gly Glu Cys Arg Asp Met Ile Pro Ser Phe Cys Arg Ala
290 295 300

Leu Ala Arg Ser His Met Ile Asp Cys Ser Phe Phe His Lys Gln Gln
305 310 315 320

Cys Cys Ala Thr Cys Ala Glu Leu Gly His Arg Asp Gln Asp Gln Gly
325 330 335

Gly Trp Leu Glu Gln Thr Gly Trp Pro Phe Asp Gly Leu Phe Arg Ile
340 345 350

Phe Gly Gln Gly Trp Pro Phe Thr Phe Phe Asn Arg Trp
355 360 365

<210> 45
<211> 621
<212> DNA
<213> Ancylostoma caninum

<400> 45
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cacccaaacgt tgaagtgaac aaattcgagg atattcctga gcagtacaga gaactgatcc 120
ccaaaggaggt agccgaccac atcaaggcta tcactgagga ggagaagacc atcttgaagg 180
aggtgctgaa ggactacgcc aaatacaagg acgagaatga gtatttgca gcgctgaagg 240
aaaagtcacc cagcctgcac gagaaggcaa agaagttcca cgacttcatt aaggctaagg 300
tcgacgcact tggggatgaa gcaaaggcgt tcgtgaagaa agtgattgct gctgctcgca 360
aactgcacgc agagctcctt gccggaaaca aacttctct tgaggaactg aagaacactg 420
tcaagaaata cgtggccgaa ttgcacgcgc tgaccgcagc cgcaaaagaa gatctcaaga 480
agcacttccc catcctcact tccatttca ccaacgagaa ggcaaaggcg ttgatggaca 540
agcacttgcc gaacttaggtg aagcagcagt tgtttttagt cgaataaatg tttcaacttt 600

US seq list.ST25.txt

ttaaaaaaaaaaaaaaaa a

621

<210> 46

<211> 181

<212> PRT

<213> Ancylostoma caninum

<400> 46

Met Leu Arg Leu Ala Leu Phe Ala Val Leu Phe Ala Cys Ala Phe Ser
1 5 10 15

Ala Pro Asn Val Glu Val Asn Lys Phe Glu Asp Ile Pro Glu Gln Tyr
20 25 30

Arg Glu Leu Ile Pro Lys Glu Val Ala Asp His Ile Lys Ala Ile Thr
35 40 45

Glu Glu Glu Lys Thr Ile Leu Lys Glu Val Leu Lys Asp Tyr Ala Lys
50 55 60

Tyr Lys Asp Glu Asn Glu Tyr Leu Ala Ala Leu Lys Glu Lys Ser Pro
65 70 75 80

Ser Leu His Glu Lys Ala Lys Lys Phe His Asp Phe Ile Lys Ala Lys
85 90 95

Val Asp Ala Leu Gly Asp Glu Ala Lys Ala Phe Val Lys Lys Val Ile
100 105 110

Ala Ala Ala Arg Lys Leu His Ala Glu Leu Leu Ala Gly Asn Lys Pro
115 120 125

Ser Leu Glu Glu Leu Lys Asn Thr Val Lys Lys Tyr Val Ala Glu Phe
130 135 140

Asp Ala Leu Thr Ala Ala Ala Lys Glu Asp Leu Lys Lys His Phe Pro
145 150 155 160

Ile Leu Thr Ser Ile Phe Thr Asn Glu Lys Ala Lys Ala Leu Met Asp
165 170 175

Lys His Leu Pro Asn
180

<210> 47

<211> 2384

<212> DNA

<213> Ancylostoma caninum

US seq list.ST25.txt

<400> 47	
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ttggctacga tcgatgcacg aataaatgta ttccgtacac gtatggaggc tgtggagggt	180
cgagcaacat gttcgacact ttggaagaat gccaagaaaa atgtggcaag cccgaggacc	240
gctgctcaaa accactggaa agaggaatat gtctggcatc aatgaaaaga tatggctacg	300
atacaagcag taagaagtgt aaggccttca tctatggcgg atgtggcggt aacgagaaca	360
atttcgagac aatggctgag tgccgagaaa cttgcaagga cacccttct gaagaagaat	420
cagtacctga tgcacatgccta ttgccatcag aagtgggccc atgtaaagga aaagaacgtc	480
gcttctactt tgatcaaaaaa cgtggcaact gcaagtcgtt cttttcgcc ggttgtggtg	540
gaaatggaaa taatttcatg accaaagcca aatgcatgga aacctgctcg aaacacatca	600
aacctgaaac agagcaagac gtctgctcac agccaattaa agctggaccc tgcacatggca	660
tgttggaaag atatgcgtac gacaacaaga aaaagaggtg cgtcagttt atctatggag	720
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aggcaatgtt gaaaagatat gcgtacgaca acaagaaaaa taagtgcgtt cggtttatct	900
atggaggatg taaggggaaac aagaacaact tcgaaagcat ggaagagtgc acccggacat	960
gtaagaaagc agtaccagag cctgagcaag acacctgctc acagcccatt gaagttggac	1020
cttgcaaggc aatgttggaa agatatgcgt acgacaacaa gaaaaataag tgcgtgcgtt	1080
ttatctatgg aggtgttaag gggaaaataaga acaacttcga aagcatggaa gagtgcaccc	1140
ggacatgcaa gaaagcagta ccagagcctg aacctgagaa agagacctgc tcacagccca	1200
ttgaagttgg accttgcaag gcaatgttga aaagatatgc gtacgacaac aagaaaaata	1260
agtgcgtacg gtttatctat ggaggatgtt agggaaacaa gaacaacttc gaaagcatgg	1320
aagagtgcac ccggacatgt aagaaagcag taccagagcc tgacgacac acctgctcac	1380
agcccattga agttggaccc tgcaaggcaa tggtaaaaaat atatgcgtac gacaacaaga	1440
aaaataagtg cgtgcgtttt atctatggag gatgttaaggg aaataagaac aacttcgaaa	1500
gcatggaaga gtgcacccgg acatgcaaga aagcgttacc agagcctgaa cctgagaaag	1560
agacctgctc tcagcccatt gaagctggc cttgcaaggc aatgggtgaga cgatttgctt	1620
acgacaacgc aaaggaaaaag tgcgttaggt tcttttacgg cggatgcaaa ggaaacaaga	1680
acaacttcga aaccatggaa gattgtactt ttacgtgtga gcaacggctg gcaaagcccg	1740
agcttgagaa ggatgtgtgt tcacaaccta tcacggctgg tccttgcaga gcatcaatac	1800
cgcgatacgg ctatgattct aaaaaacgaa agtgtgtgaa gttcacctac ggaggatgca	1860

US seq list.ST25.txt

aaggaaatgg taataggttc ccgacgaaga atgaatgtga gaagacatgc aagagaggag	1920
caactggaac tacgaatcca ggaggtgaaa atgataaatg cttgctgcc attgttaccg	1980
gcccatgcaa aggaaaaat cgtcgctatg cttacaacaa caagacagga aaatgcgtga	2040
gattcaccta tggtggttgc ggggaaacg agaacaactt caagactaag aaagactgcc	2100
aggatgcgtg cgaaaacata aatcagacta gtccatgcac ctttcctatc gacaaaggag	2160
aaggcgactt gaatctgacc agatatggct tcaaaaatgg caagtgtgtc gcgttcaaatt	2220
acggccggacg acggggaaat ctcaacaatt ttgaaagcaa agccgattgc aaagaagcct	2280
gcctcaagta actacgaagc tccgctgcaa atcccagaag atcattcggt tgtctctgcc	2340
gtctatgaaa caataaagta ttaattttgt taaaaaaaaaaa aaaa	2384

<210> 48

<211> 759

<212> PRT

<213> *Ancylostoma caninum*

<400> 48

Met Lys Val Leu Ala Leu Val Leu Leu Trp Ala Ala Thr Ala Thr Ala
1 5 10 15

Leu Leu Asp Ile Cys Lys Glu Glu Ile Lys Thr Gly Asn Cys Arg Gly
20 25 30

Ala Phe Arg Lys Phe Gly Tyr Asp Arg Cys Thr Asn Lys Cys Ile Pro
35 40 45

Tyr Thr Tyr Gly Gly Cys Gly Ser Ser Asn Met Phe Asp Thr Leu
50 55 60

Glu Glu Cys Gln Glu Lys Cys Gly Lys Pro Glu Asp Arg Cys Ser Lys
65 70 75 80

Pro Leu Glu Arg Gly Ile Cys Leu Ala Ser Met Lys Arg Tyr Gly Tyr
85 90 95

Asp Thr Ser Ser Lys Lys Cys Lys Ala Phe Ile Tyr Gly Gly Cys Gly
100 105 110

Gly Asn Glu Asn Asn Phe Glu Thr Met Ala Glu Cys Arg Glu Thr Cys
115 120 125

Lys Asp Thr Ser Ser Glu Glu Glu Ser Val Pro Asp Ala Cys Leu Leu
130 135 140

US seq list.ST25.txt

Pro Ser Glu Val Gly Pro Cys Lys Gly Lys Glu Arg Arg Phe Tyr Phe
145 150 155 160

Asp Gln Lys Arg Gly Asn Cys Lys Ser Phe Phe Gly Gly Cys Gly
165 170 175

Gly Asn Gly Asn Asn Phe Met Thr Lys Ala Lys Cys Met Glu Thr Cys
180 185 190

Ser Lys His Ile Lys Pro Glu Thr Glu Gln Asp Val Cys Ser Gln Pro
195 200 205

Ile Lys Ala Gly Pro Cys Met Ala Met Leu Lys Arg Tyr Ala Tyr Asp
210 215 220

Asn Lys Lys Lys Arg Cys Val Gln Phe Ile Tyr Gly Gly Cys Lys Gly
225 230 235 240

Asn Lys Asn Asn Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys
245 250 255

Lys Ala Val Pro Glu Pro Glu Gln Asp Thr Cys Ser Gln Pro Ile Glu
260 265 270

Val Gly Pro Cys Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys
275 280 285

Lys Asn Lys Cys Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys
290 295 300

Asn Asn Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala
305 310 315 320

Val Pro Glu Pro Glu Gln Asp Thr Cys Ser Gln Pro Ile Glu Val Gly
325 330 335

Pro Cys Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys Lys Asn
340 345 350

Lys Cys Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn
355 360 365

Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala Val Pro
370 375 380

Glu Pro Glu Pro Glu Lys Glu Thr Cys Ser Gln Pro Ile Glu Val Gly
385 390 395 400

US seq list.ST25.txt

Pro Cys Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys Lys Asn
405 410 415

Lys Cys Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn
420 425 430

Phe Glu Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala Val Pro
435 440 445

Glu Pro Glu Gln Asp Thr Cys Ser Gln Pro Ile Glu Val Gly Pro Cys
450 455 460

Lys Ala Met Leu Lys Arg Tyr Ala Tyr Asp Asn Lys Lys Asn Lys Cys
465 470 475 480

Val Arg Phe Ile Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn Phe Glu
485 490 495

Ser Met Glu Glu Cys Thr Arg Thr Cys Lys Lys Ala Val Pro Glu Pro
500 505 510

Glu Pro Glu Lys Glu Thr Cys Ser Gln Pro Ile Glu Ala Gly Pro Cys
515 520 525

Lys Ala Met Val Arg Arg Phe Ala Tyr Asp Asn Ala Lys Glu Lys Cys
530 535 540

Val Glu Phe Phe Tyr Gly Gly Cys Lys Gly Asn Lys Asn Asn Phe Glu
545 550 555 560

Thr Met Glu Asp Cys Thr Phe Thr Cys Glu Gln Arg Leu Ala Lys Pro
565 570 575

Glu Leu Glu Lys Asp Val Cys Ser Gln Pro Ile Thr Ala Gly Pro Cys
580 585 590

Arg Ala Ser Ile Pro Arg Tyr Gly Tyr Asp Ser Lys Lys Arg Lys Cys
595 600 605

Val Lys Phe Thr Tyr Gly Gly Cys Lys Gly Asn Gly Asn Arg Phe Pro
610 615 620

Thr Lys Asn Glu Cys Glu Lys Thr Cys Lys Arg Gly Ala Thr Gly Thr
625 630 635 640

Thr Asn Pro Gly Gly Glu Asn Asp Lys Cys Leu Leu Pro Ile Val Thr
645 650 655

US seq list.ST25.txt

Gly Pro Cys Lys Gly Lys Asn Arg Arg Tyr Ala Tyr Asn Asn Lys Thr
660 665 670

Gly Lys Cys Val Arg Phe Thr Tyr Gly Gly Cys Gly Gly Asn Glu Asn
675 680 685

Asn Phe Lys Thr Lys Lys Asp Cys Gln Asp Ala Cys Glu Asn Ile Asn
690 695 700

Ala Ala Ser Pro Cys Thr Leu Pro Ile Asp Lys Gly Glu Gly Asp Leu
705 710 715 720

Asn Leu Thr Arg Tyr Gly Phe Lys Asn Gly Lys Cys Val Ala Phe Lys
725 730 735

Tyr Gly Gly Arg Arg Gly Asn Leu Asn Asn Phe Gly Ser Lys Ala Asp
740 745 750

Cys Lys Glu Ala Cys Leu Lys
755

<210> 49
<211> 1413
<212> DNA
<213> Ancylostoma caninum

<400> 49
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cgctatgtga agtcgggtgtc gcttcgcgt caaccaacac ttcgtgaacg attgctcgga 120
actggcagtt gggaaagacta tcagaaacag cgtttaccact accagaagaa acttctggca 180
aagtatgcgg cgatcaaagc gacaaaactg cagtctacca atgaaaattga cgagcttctt 240
cgcaactaca tggatgcgca atacttcggc accatccaaa tcggaactcc agcgcagaat 300
ttcacagtga ttttcgacac cggttcttcc aatctgtggg tgccgtccga gaaaatgcca 360
ttccacgaca tcgcgtgcat gcttcgtcac cgttatgact ccggagcatc gtcgacgtac 420
aaggaggatg gacgaaagat ggccatccag tatggcactg gctcaatgaa gggcttcatt 480
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acgagcgcgc caggcctcac cttcatcgca gcgaagttt atggaatcct tggcataacc 600
ttccctgaaa tctctgtgct cggagtaccg ccagtattcc acacgttcat tgaacagaag 660
aaagtgccga gcccggtgaa cgctctctgg ctcaacagaa atcctgactc ggaactcgga 720
ggtgagatca ccctcggtgg aatggacacc cgacgatacg ttgagccat cacatggact 780
ccagtgacaa ggcgagggtta ctggcagttc aagatggaca aggttcaagg aggatcaaca 840

US seq list.ST25.txt

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acttatgaag	gagagtacat	gattccttgc	gacaagggtgc	ctttccctcc	ccgattatcc	1020
ttcggttatcg	aagccgcac	tttcaccctc	aagggtgagg	attacgtctt	gaccgtgaaa	1080
gctgggtgta	aatcgatttg	cctgtccggt	ttcatggaa	tggacttccc	agagaggatc	1140
ggagagttgt	ggattcttgg	ggacgttttt	attggaaagt	actacaccgt	cttcgatgtt	1200
ggccaggccc	gtcttggatt	cgctcaagct	aagtcaagaag	atggctatcc	ggttggccct	1260
gctgttcgaa	ggtacaacaa	gttctcgag	gacagcggca	gtgatgagga	tgatgtattc	1320
actctataag	taacatgtat	ccacaacttg	ctctaattcct	gatacgtgta	ccgtgtctaa	1380
cgtgcttcca	ccttgataa	actgattaaat	ctc			1413

<210> 50

<211> 442

<212> PRT

<213> Ancylostoma caninum

<400> 50

Leu Ala Leu Phe Thr Leu Ala Val Ala Ser Val His Arg Arg Thr Phe
1 5 10 15

His His Pro Arg Arg Tyr Val Lys Ser Val Ser Leu Ser Arg Gln Pro
20 25 30

Thr Leu Arg Glu Arg Leu Leu Gly Thr Gly Ser Trp Glu Asp Tyr Gln
35 40 45

Lys Gln Arg Tyr His Tyr Gln Lys Lys Leu Leu Ala Lys Tyr Ala Ala
50 55 60

Ile Lys Ala Thr Lys Leu Gln Ser Thr Asn Glu Ile Asp Glu Leu Leu
65 70 75 80

Arg Asn Tyr Met Asp Ala Gln Tyr Phe Gly Thr Ile Gln Ile Gly Thr
85 90 95

Pro Ala Gln Asn Phe Thr Val Ile Phe Asp Thr Gly Ser Ser Asn Leu
100 105 110

Trp Val Pro Ser Glu Lys Met Pro Phe His Asp Ile Ala Cys Met Leu
115 120 125

Arg His Arg Tyr Asp Ser Gly Ala Ser Ser Thr Tyr Lys Glu Asp Gly
130 135 140

US seq list.ST25.txt

Arg Lys Met Ala Ile Gln Tyr Gly Thr Gly Ser Met Lys Gly Phe Ile
145 150 155 160

Ser Lys Asp Asn Val Cys Ile Ala Gly Ile Cys Ala Glu Glu Gln Pro
165 170 175

Phe Ala Glu Ala Thr Ser Glu Pro Gly Leu Thr Phe Ile Ala Ala Lys
180 185 190

Phe Asp Gly Ile Leu Gly Ile Thr Phe Pro Glu Ile Ser Val Leu Gly
195 200 205

Val Pro Pro Val Phe His Thr Phe Ile Glu Gln Lys Lys Val Pro Ser
210 215 220

Pro Val Phe Ala Leu Trp Leu Asn Arg Asn Pro Asp Ser Glu Leu Gly
225 230 235 240

Gly Glu Ile Thr Leu Gly Gly Asn Asp Thr Arg Arg Tyr Val Glu Pro
245 250 255

Ile Thr Trp Thr Pro Val Thr Arg Arg Gly Tyr Trp Gln Phe Lys Met
260 265 270

Asp Lys Val Gln Gly Gly Ser Thr Ser Ile Ala Cys Pro Asn Glu Phe
275 280 285

Ser Gly Cys Gln Ala Ile Ala Asp Thr Gly Thr Ser Leu Ile Ala Gly
290 295 300

Pro Lys Ala Gln Ser Arg Ala Ser Arg Asn Ser Leu Val Leu Glu Pro
305 310 315 320

Thr Tyr Glu Gly Glu Tyr Met Ile Pro Cys Asp Lys Val Pro Phe Pro
325 330 335

Pro Arg Leu Ser Phe Val Ile Glu Ala Arg Thr Phe Thr Leu Lys Gly
340 345 350

Glu Asp Tyr Val Leu Thr Val Lys Ala Gly Gly Lys Ser Ile Cys Leu
355 360 365

Ser Gly Phe Met Gly Met Asp Phe Pro Glu Arg Ile Gly Glu Leu Trp
370 375 380

Ile Leu Gly Asp Val Phe Ile Gly Lys Tyr Tyr Thr Val Phe Asp Val
Page 65

385 390 395 400

Gly Gln Ala Arg Leu Gly Phe Ala Gln Ala Lys Ser Glu Asp Gly Tyr
405 410 415

Pro Val Gly Pro Ala Val Arg Arg Tyr Asn Lys Phe Ser Glu Asp Ser
420 425 430

Gly Ser Asp Glu Asp Asp Val Phe Thr Leu
435 440

<210> 51
<211> 421
<212> DNA
<213> Ancylostoma caninum

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<222> (413)..(413)
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gcgtctatca cgctcacaat tggccagcgc cagtacaaaa ttgaatcaaa gaacctcatc 180
attcatgtcg aagcagatac atgcataatttgcactacatg gataccactt tctcggagca 240
acatggatct ttgggtgcacc gttcataagg cagttctgtt atatttatga tatgggtaac 300
aaaaggatag gattcgctca ttcgctgcag aattagcctg catttactag ttnttattcg 360
acattnntaa acaactccct caataaaagta ttgngttca aaaaaaaaaa aaaaaaaaaa 420
a 421

US seq list.ST25.txt

<210> 52
<211> 111
<212> PRT
<213> Ancylostoma caninum

<400> 52

Leu Thr Gln Val His Gln Ile Ser Gly Ala Pro Ala Tyr Tyr Val Glu
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Glu Ile Ala Ser Asn Leu Thr Ala Thr Tyr Asn Lys Glu His Asp Leu
20 25 30

Tyr Tyr Ile Asp Cys Arg Ala Asn Ala Ser Ile Thr Leu Thr Ile Gly
35 40 45

Gln Arg Gln Tyr Lys Ile Glu Ser Lys Asn Leu Ile Ile His Val Glu
50 55 60

Ala Asp Thr Cys Ile Leu Ala Leu His Gly Tyr His Phe Leu Gly Ala
65 70 75 80

Thr Trp Ile Phe Gly Ala Pro Phe Ile Arg Gln Phe Cys Asn Ile Tyr
85 90 95

Asp Met Gly Asn Lys Arg Ile Gly Phe Ala His Ser Leu Gln Asn
100 105 110

<210> 53
<211> 371
<212> DNA
<213> Ancylostoma caninum

<400> 53
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ggttgtttat tacctcctgc ttgcgtatgc aaagacggat tctacagaga cacggtgatc 180
ggcgactgtg ttaggaaaga agaatgcgac caacatgaga ttatacatgt ctgaacgaga 240
aagcaacaat aaccaaaggT tccaaactctc gctctgcaaa atcgcttagtt ggatgtctct 300
tttgcgtccg aatagttta gttgatatta agtaagaact cctgctggaa agaataaagc 360
tttccaaactc C 371

<210> 54
<211> 77
<212> PRT
<213> Ancylostoma caninum

<400> 54

US seq list.ST25.txt

Lys Ala Tyr Pro Glu Cys Gly Glu Asn Glu Trp Leu Asp Asp Cys Gly
1 5 10 15

Thr Gln Lys Pro Cys Glu Ala Lys Cys Asn Glu Glu Pro Pro Glu Glu
20 25 30

Glu Asp Pro Ile Cys Arg Ser Arg Gly Cys Leu Leu Pro Pro Ala Cys
35 40 45

Val Cys Lys Asp Gly Phe Tyr Arg Asp Thr Val Ile Gly Asp Cys Val
50 55 60

Arg Glu Glu Glu Cys Asp Gln His Glu Ile Ile His Val
65 70 75

<210> 55

<211> 1321

<212> DNA

<213> Ancylostoma ceylanicum

<400> 55

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cctcgacttc	cacaacaatg	ctcggagacg	agttgcgaa	ggagttgagg	ataacaaatc	180
cgccaaactg	aatccagcga	agaacatgta	taagctggac	tggactgtg	agatgaaaca	240
gaagctccag	gatgctatcc	aatcctgccc	aggcggctt	gctgaaattc	aaggtgtgc	300
gcagaatata	ataagctgg	caggctccgg	tggattcccg	aatccatcag	aaaagataaa	360
ctcaacactt	gccagctgg	ggggtggtgc	aaaaaacaac	ggcgtcgcc	cagacaacaa	420
atacactgg	ggaggtctt	acgcctttc	caatatggc	ttctctgaga	cgacaaaact	480
cgggtgcgc	tacaagg	gcggcactaa	actgacgct	tcgtgcattt	ataacggaat	540
tggtatatg	acaggcgcgc	caatgtgg	gacaggtcag	gcttgcaagg	ccggaggcaga	600
ctgcaccaca	ttcaagaact	caggttgcga	agacggcctc	tgcacgaaag	gagcagatgt	660
ccctgagacg	aaccagcagt	gtccgtcaa	caccgaaatg	actgattcag	tcagagatac	720
tttccttca	ttgcacaac	aattcagg	gagtgttgcc	cgaggttgg	aacccgatgc	780
tcttggcga	aatgcacca	aagcatccaa	aatgctcaag	atggtgtacg	actgtgaagt	840
agaagcatca	gccatcagac	atggaaataa	atgcgtctac	caacattctc	acggcgtat	900
aagacccggc	ctaggagaaa	acatttacaa	aaccagcatt	gtcaaattt	agaagaacaa	960
agcagccaag	caggcttcac	aactttgg	gaacgagtt	aaagagttc	gtgtcggccc	1020
atccaacatg	ctcactgat	ctctctggaa	caggccaaac	atgcagatt	gtcattacac	1080

US seq list.ST25.txt

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tattggtcaa ccatgttccg agtgtgaagc taccgccact tgcagcgtga ccgaaggatt 1260
gtgcagtgct ccttaattag tctacaataa agatgctact ttccaaaaaaaaaaaaaaaaa 1320
a 1321

<210> 56

<211> 422

<212> PRT

<213> Ancylostoma ceylanicum

<400> 56

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20 25 30

Thr Asp Ser Asp Arg Gln Ala Phe Leu Asp Phe His Asn Asn Ala Arg
35 40 45

Arg Arg Val Ala Gln Gly Val Glu Asp Asn Lys Ser Gly Lys Leu Asn
50 55 60

Pro Ala Lys Asn Met Tyr Lys Leu Asp Trp Asp Cys Glu Met Glu Gln
65 70 75 80

Lys Leu Gln Asp Ala Ile Gln Ser Cys Pro Gly Gly Phe Ala Gly Ile
85 90 95

Gln Gly Val Ala Gln Asn Ile Ile Ser Trp Ser Gly Ser Gly Gly Phe
100 105 110

Pro Asn Pro Ser Glu Lys Ile Asn Ser Thr Leu Ala Ser Trp Trp Gly
115 120 125

Gly Ala Lys Asn Asn Gly Val Ala Ser Asp Asn Lys Tyr Thr Gly Gly
130 135 140

Gly Leu Tyr Ala Phe Ser Asn Met Val Phe Ser Glu Thr Thr Lys Leu
145 150 155 160

Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Leu Thr Leu Ser Cys Tyr
165 170 175

Asn Gly Ile Gly Tyr Met Thr Gly Ala Pro Met Trp Glu Thr Gly Gln
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180

US seq list.ST25.txt
185 190

Ala Cys Lys Ala Gly Ala Asp Cys Thr Thr Phe Lys Asn Ser Gly Cys
195 200 205

Glu Asp Gly Leu Cys Thr Lys Gly Ala Asp Val Pro Glu Thr Asn Gln
210 215 220

Gln Cys Pro Ser Asn Thr Gly Met Thr Asp Ser Val Arg Asp Thr Phe
225 230 235 240

Leu Ser Leu His Asn Glu Phe Arg Ser Ser Val Ala Arg Gly Leu Glu
245 250 255

Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ser Lys Met Leu Lys
260 265 270

Met Val Tyr Asp Cys Glu Val Glu Ala Ser Ala Ile Arg His Gly Asn
275 280 285

Lys Cys Val Tyr Gln His Ser His Gly Asp Glu Arg Pro Gly Leu Gly
290 295 300

Glu Asn Ile Tyr Lys Thr Ser Ile Val Lys Phe Glu Lys Asn Lys Ala
305 310 315 320

Ala Lys Gln Ala Ser Gln Leu Trp Trp Asn Glu Leu Lys Glu Phe Gly
325 330 335

Val Gly Pro Ser Asn Met Leu Thr Asp Ala Trp Asn Arg Pro Asn Met
340 345 350

Gln Ile Gly His Tyr Thr Gln Met Ala Trp Glu Ser Thr Tyr Lys Leu
355 360 365

Gly Cys Ala Val Ile Phe Cys Asn Asp Phe Thr Phe Gly Val Cys Gln
370 375 380

Tyr Gly Pro Gly Gly Asn Tyr Met Asn His Leu Ile Tyr Thr Ile Gly
385 390 395 400

Gln Pro Cys Ser Glu Cys Glu Ala Thr Ala Thr Cys Ser Val Thr Glu
405 410 415

Gly Leu Cys Ser Ala Pro
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US seq list.ST25.txt

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 <213> Ancylostoma ceylanicum

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 agatcgagg ttgccaaagg acaggccaag gatgcactt cagggaaatgc accaaaagct 180
 gccaaaatga agaaaatggt atatgactgt ggtgtcgaat caactgcaat gcagaatgct 240
 aaaaaatgtg tcttcactca ttcgcatatg aaggacttg gcgaaaacat atggatgacg 300
 actgcacgca agatggataa agtgaatca gctgaacagg ctagtcaggg ttggttcagt 360
 gaactcgcgg aatacgggt agggcctgaa aataagctaa caatgcagct gtggAACAGG 420
 ccaaataactc agattggaca ttacacgcag atggcttggc aggacaccta caaactcgga 480
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 aacatgatga actcaatcat ctacgaaaaa ggaaaccctt gcactcagga ttccggactgt 600
 ggctcaaatg ccagatgcac cgctgacaag gcgcTTGCA tcgtgcattgg atagctggc 660
 tatcccacgg tcaacagcgc ttctactaat tagcttgc tccctataa ataaatgcat 720
 tgaaacaaaa aaaaaaaaaa 740

<210> 58
 <211> 217
 <212> PRT
 <213> Ancylostoma ceylanicum

<400> 58

Val Leu Val Pro Leu Leu Val Leu Leu Ala Val Ser Val Asp Ala Asn
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Ser Val Arg Cys Gly Asn Asn Gly Met Thr Asp Glu Ala Arg Gln Lys
 20 25 30

Phe Leu Asp Met His Asn Gly Tyr Arg Ser Gln Val Ala Lys Gly Gln
 35 40 45

Ala Lys Asp Ala Leu Ser Gly Asn Ala Pro Lys Ala Ala Lys Met Lys
 50 55 60

Lys Met Val Tyr Asp Cys Gly Val Glu Ser Thr Ala Met Gln Asn Ala
 65 70 75 80

Lys Lys Cys Val Phe Thr His Ser His Met Lys Gly Leu Gly Glu Asn
 85 90 95

US seq list.ST25.txt

Ile Trp Met Thr Thr Ala Arg Glu Met Asp Lys Val Lys Ser Ala Glu
 100 105 110

Gln Ala Ser Gln Gly Trp Phe Ser Glu Leu Ala Glu Tyr Gly Val Gly
 115 120 125

Pro Glu Asn Lys Leu Thr Met Gln Leu Trp Asn Arg Pro Asn Thr Gln
 130 135 140

Ile Gly His Tyr Thr Gln Met Val Trp Gln Asp Thr Tyr Lys Leu Gly
 145 150 155 160

Cys Tyr Val Glu Trp Cys Ser Ser Met Thr Tyr Gly Val Cys Gln Tyr
 165 170 175

Ser Pro Gln Gly Asn Met Met Asn Ser Ile Ile Tyr Glu Lys Gly Asn
 180 185 190

Pro Cys Thr Gln Asp Ser Asp Cys Gly Ser Asn Ala Arg Cys Thr Ala
 195 200 205

Asp Lys Ala Leu Cys Ile Val His Gly
 210 215

<210> 59
 <211> 1705

<212> DNA
 <213> Ancylostoma ceylanicum

<400> 59

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aggctaagct	gaagctctcc	ccggcacgaa	aagccctact	aggcgaaatt	atgaagcaca	240
ttattaaaat	caaaaaggat	aaaattcaag	agaaaggatg	ctcaatcgaa	gaaatcaact	300
cggaaaagtgc	tatcgagag	ttgctgtacc	aaggtaacat	cgttctgaca	aataagcaag	360
cccgaggat	tggtgatgac	attgagggtg	atgaaaatga	ccgcggaaaa	cgacaggcgt	420
tccgtatcg	caactatcca	cgacattat	ggtcgaaggg	agtgtattat	tacttccatg	480
gaaacgcaac	tcctgaggtg	agaagcgttt	tcacgaaagg	cgcaagactt	tggatgaaag	540
ataacttgcac	tgacttcttt	gagagcaact	cagcacccga	taggattcga	gttttcaaag	600
aacaaggatg	ttggtcgtac	gttggtagga	tcgggggtca	gcaagatctg	tcgctggaa	660
aaggctgtga	atcggttgg	acagctgcac	acgaaatcgg	tcatgctatt	ggcttctacc	720

US seq list.ST25.txt

acactcactc aagacacgat	cgcgataact	tcatcacatt	taacgcacaa	aatgtcaagc	780	
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catacgacta	cggaagtatt	atgcaactatg	gcgcaaatacg	cgcctctgca	aatggacagc	900
cttcaatggt	tccgttgac	ccgaaatacg	tagaaactct	cggatcaccc	ataatttcct	960
tttatgaact	tctcatgatc	aacaaaccct	acgagtgcac	caagaattgc	gatccgaata	1020
cttctgcgca	gtgtaagatg	ggtggcttcc	cacatcctcg	ggattgtgga	agatgcattt	1080
gtcccagtgg	atatggaggc	caactatgcg	accagaagcc	atccggatgc	ggatcgatcc	1140
tccaagcgac	cgctcagttac	cagaacttgc	acgacaaacg	tggaaacgaa	gcagcagggc	1200
agagacctag	agaagacatg	gacttctgct	actactggat	tacggctcca	cagggttcaa	1260
gaatcgaaat	caaaatcgct	gatctatctc	gaggagccgc	tgttgtatggg	tgtcagttatt	1320
ggggagtaga	aattaagact	cacgctgacc	agcgcctcac	tggctacagg	ttctgtgctc	1380
cagaagatgt	cggacgtaca	ttgggtgtcga	actctaacat	cgtaccaata	atcacataca	1440
atagatttt	tgcaaccact	gttgatatcc	agtaccgaat	cgttgggtgtt	aatgttggcg	1500
gaccaaggcc	tcagccacaa	ccaaacagca	attgcgtcga	caatgaacag	tgcgcgaccc	1560
tcatcagaac	aaagaatttc	tgtcagagca	gatcgttcac	agagtccgtc	aaaagaggtc	1620
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cgcagcatca	aaaaaaaaaa	aaaaaa				1705

<210> 60

<211> 545

<212> PRT

<213> Ancylostoma ceylanicum

<400> 60

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 20 25 30

Lys Ile Lys Ala Ala Leu Asn Gly Thr Leu Leu Met Lys Ile Arg Glu
 35 40 45

Lys Phe Ile Ala Leu Arg Glu Lys Ile Lys Ala Lys Leu Lys Leu Ser
 50 55 60

Pro Ala Arg Lys Ala Leu Leu Gly Glu Ile Met Lys His Ile Ile Lys
 65 70 75 80

Ile Lys Lys Asp Lys Ile Gln Glu Lys Gly Asp Ser Ile Glu Glu Ile
 Page 73

85 US seq list.ST25.txt 90 95

Asn Ser Lys Ser Ala Ile Gly Glu Leu Leu Tyr Gln Gly Asp Ile Val
100 105 110

Leu Thr Asn Lys Gln Ala Gln Glu Ile Val Asp Ile Glu Gly Asp Glu
115 120 125

Asn Asp Arg Gly Lys Arg Gln Ala Phe Arg Asp Arg Asn Tyr Pro Arg
130 135 140

Thr Leu Trp Ser Lys Gly Val Tyr Tyr Tyr Phe His Gly Asn Ala Thr
145 150 155 160

Pro Glu Val Arg Ser Val Phe Thr Lys Gly Ala Arg Leu Trp Met Lys
165 170 175

Asp Thr Cys Ile Asp Phe Phe Glu Ser Asn Ser Ala Pro Asp Arg Ile
180 185 190

Arg Val Phe Lys Glu Gln Gly Cys Trp Ser Tyr Val Gly Arg Ile Gly
195 200 205

Gly Gln Gln Asp Leu Ser Leu Gly Lys Gly Cys Glu Ser Val Gly Thr
210 215 220

Ala Ala His Glu Ile Gly His Ala Ile Gly Phe Tyr His Thr His Ser
225 230 235 240

Arg His Asp Arg Asp Asn Phe Ile Thr Phe Asn Ala Gln Asn Val Lys
245 250 255

Pro Asp Trp Leu Asp Gln Phe Thr Lys Gln Thr Pro Ala Thr Asn Glu
260 265 270

Asn Tyr Gly Ile Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly Ala
275 280 285

Asn Ser Ala Ser Ala Asn Gly Gln Pro Ser Met Val Pro Phe Asp Pro
290 295 300

Lys Tyr Val Glu Thr Leu Gly Ser Pro Ile Ile Ser Phe Tyr Glu Leu
305 310 315 320

Leu Met Ile Asn Lys Pro Tyr Glu Cys Thr Lys Asn Cys Asp Pro Asn
325 330 335

us seq list.ST25.txt

Thr Ser Ala Gln Cys Lys Met Gly Gly Phe Pro His Pro Arg Asp Cys
340 345 350

Gly Arg Cys Ile Cys Pro Ser Gly Tyr Gly Gly Gln Leu Cys Asp Gln
355 360 365

Lys Pro Ser Gly Cys Gly Ser Ile Leu Gln Ala Thr Ala Gln Tyr Gln
370 375 380

Asn Leu His Asp Lys Arg Gly Asn Glu Ala Ala Gln Arg Pro Arg
385 390 395 400

Glu Asp Met Asp Phe Cys Tyr Tyr Trp Ile Thr Ala Pro Gln Gly Ser
405 410 415

Arg Ile Glu Ile Lys Ile Ala Asp Leu Ser Arg Gly Ala Ala Val Asp
420 425 430

Gly Cys Gln Tyr Trp Gly Val Glu Ile Lys Thr His Ala Asp Gln Arg
435 440 445

Leu Thr Gly Tyr Arg Phe Cys Ala Pro Glu Asp Val Gly Arg Thr Leu
450 455 460

Val Ser Asn Ser Asn Ile Val Pro Ile Ile Thr Tyr Asn Phe Tyr Ala
465 470 475 480

Thr Thr Val Asp Ile Gln Tyr Arg Ile Val Gly Gly Asn Val Gly Gly
485 490 495

Pro Arg Pro Gln Pro Gln Pro Asn Ser Asn Cys Val Asp Asn Glu Gln
500 505 510

Cys Ala Thr Leu Ile Arg Thr Lys Asn Phe Cys Gln Ser Arg Ser Phe
515 520 525

Thr Glu Ser Val Lys Arg Gly Leu Cys Pro Lys Ala Cys Gly Phe Cys
530 535 540

Arg
545

<210> 61
<211> 893
<212> DNA
<213> Ancylostoma ceylanicum

<400> 61
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US seq list.ST25.txt

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acgcgaaatt	aatccatcg	agcagcaaga	gttggtaaag	tatcagaacg	acgtagccga	240
atataagacg	gccctgaaac	aagcgatcaa	ggagcgagaa	gagaagatcc	gagccgtct	300
cgcggcaag	aaggtgaagg	ccgttgagtc	gaccaagaa	gaggacctgc	cgaagccgc	360
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gatccagaac	aacaagatct	acgtcgaaa	cacttcgct	cgtgacactga	cccaatctga	480
aatcggcgaa	ctgaaggaat	tcgagaagaa	attcaaggtc	taccaggact	acgttcagaa	540
gcaggccgaa	cagcaagtga	acagccttt	cggcgcctct	gacttcttct	cggcactgtt	600
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tcccggcag	ccgcccacgc	ccaacttctg	caccagaata	atctaaacgt	gctctgaatt	720
gtccacttag	ttgttggatt	ggttggttg	gtgaatagcg	acttcgcttc	ccctctcgta	780
cttacggtgt	cgactagcac	attagtcatg	cgttgcata	tttgatcatt	gtattaaggt	840
atattgtaca	tttatataat	aaaattataat	ttcaactcaa	aaaaaaaaaa	aaa	893

<210> 62

<211> 227

<212> PRT

<213> *Ancylostoma ceylanicum*

<400> 62

Met Lys Leu Leu Ala Leu Ser Ala Leu Cys Ala Leu Ala Phe Ala Ala
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Pro Arg Asp Lys Arg Leu Ala Val Ser Thr Ile Thr Val Thr Gly Gly
 20 25 30

Leu Gly Leu Ser Thr Gly Cys Val Val Thr Gly Asn Val Leu Tyr Ala
 35 40 45

Asn Gly Phe Arg Val Arg Glu Ile Asn Pro Ser Glu Gln Gln Glu Leu
 50 55 60

Val Lys Tyr Gln Asn Asp Val Ala Glu Tyr Lys Thr Ala Leu Lys Gln
 65 70 75 80

Ala Ile Lys Glu Arg Glu Glu Lys Ile Arg Ala Arg Leu Ala Gly Lys
 85 90 95

Lys Val Lys Ala Val Glu Ser Thr Lys Glu Glu Asp Leu Pro Lys Pro
 100 105 110

US seq list.ST25.txt

Pro Gln Lys Pro Ser Phe Cys Thr Pro Glu Asp Thr Thr Gln Phe Phe
115 120 125

Phe Glu Gly Cys Met Ile Gln Asn Asn Lys Ile Tyr Val Gly Asn Thr
130 135 140

Phe Ala Arg Asp Leu Thr Gln Ser Glu Ile Gly Glu Leu Lys Glu Phe
145 150 155 160

Glu Lys Lys Phe Lys Val Tyr Gln Asp Tyr Val Gln Lys Gln Ala Glu
165 170 175

Gln Gln Val Asn Ser Leu Phe Gly Gly Ser Asp Phe Phe Ser Ala Leu
180 185 190

Phe Ser Gly Gly Glu Thr Lys Pro Ser Thr Thr Thr Val Ala Pro Glu
195 200 205

Leu Pro Glu Asp Ala Pro Glu Gln Pro Pro Thr Pro Asn Phe Cys Thr
210 215 220

Arg Ile Ile
225

<210> 63
<211> 407
<212> DNA
<213> Ancylostoma ceylanicum

<400> 63
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agcagcgaac gtcAGAGTGA agttgtggga agaAGACACA ggaccAGATC cAGATGACCT 180
actggatgca ggataCACGA actctaATGG tgaattccaa ctccaAGGCG gaacaataga 240
gacgactccc attgatccc tcttggaaat ttaccatgat tgcaatgacg tgactggttt 300
tctgagcgta cctaaACCTG gcagcagaaa agtgaggTTc tccttaccgg acaaatacat 360
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<210> 64
<211> 127
<212> PRT
<213> Ancylostoma ceylanicum

<400> 64

Met Ile Gln Leu Leu Leu Ala Leu Leu Pro Val Cys Ile Ser Val
Page 77

1

5

US seq list.ST25.txt

10

15

Arg Glu Gln Ser Ile Ala Val Lys Gly Arg Leu Leu Cys Gly Asp Gln
20 25 30

Pro Ala Ala Asn Val Arg Val Lys Leu Trp Glu Glu Asp Thr Gly Pro
35 40 45

Asp Pro Asp Asp Leu Leu Asp Ala Gly Tyr Thr Asn Ser Asn Gly Glu
50 55 60

Phe Gln Leu Gln Gly Gly Thr Ile Glu Thr Thr Pro Ile Asp Pro Val
65 70 75 80

Leu Lys Ile Tyr His Asp Cys Asn Asp Val Thr Gly Phe Leu Ser Val
85 90 95

Pro Lys Pro Gly Ser Arg Lys Val Arg Phe Ser Leu Pro Asp Lys Tyr
100 105 110

Ile Ser Asp Gly Met Val Pro Lys Lys Val Met Asp Ile Gly Val
115 120 125

<210> 65

<211> 26

<212> DNA

<213> Artificial

<220>

<223> synthetic oligonucleotide primer

<400> 65

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<210> 66

<211> 25

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide primer

<400> 66

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25

<210> 67

<211> 425

<212> PRT

<213> Ancylostoma duodenale

<400> 67

Met Phe Ser Ser Val Val Val Ile Ser Val Ile Ser Thr Ile Ala Phe
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US seq list.ST25.txt
1 5 10 15

Cys Asp Ala Ser Pro Ala Arg Ala Ser Phe Gly Cys Ser Asn Asn Gly
20 25 30

Ile Thr Asp Ser Asp Arg Gln Ala Phe Leu Asp Phe His Asn Asn Ala
35 40 45

Arg Arg Arg Val Ala Gln Gly Val Glu Asp Asn Lys Ser Gly Lys Leu
50 55 60

Asn Pro Ala Lys Asn Met Tyr Lys Leu Glu Trp Asp Cys Lys Met Glu
65 70 75 80

Gln Gln Leu Gln Asp Ala Ile Gln Ser Cys Pro Gly Gly Ser Ala Gly
85 90 95

Ile Gln Gly Phe Ser Gln Asn Val Met Ser Trp Ser Asn Ser Gly Gly
100 105 110

Phe Pro Asn Ser Ser Glu Lys Ile Glu Ser Thr Leu Ser Gly Trp Trp
115 120 125

Ser Gly Ala Lys Asn Asn Gly Val Gly Ser Asp Asn Lys Tyr Thr Gly
130 135 140

Gly Gly Leu Tyr Ala Phe Ser Asn Met Val Phe Ser Glu Thr Thr Lys
145 150 155 160

Ile Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Met Ala Thr Ser Cys
165 170 175

Ile Tyr Asn Gly Ile Gly Tyr Ile Thr Asn Ala Pro Met Trp Glu Thr
180 185 190

Gly Gln Ala Cys Lys Thr Gly Ala Asp Cys Ser Thr Tyr Lys Asn Ser
195 200 205

Gly Cys Glu Asp Ser Leu Cys Thr Lys Gly Ala Asp Val Pro Glu Thr
210 215 220

Asn Gln Gln Cys Pro Ser Asn Thr Gly Met Thr Asp Ser Val Arg Asp
225 230 235 240

Thr Phe Leu Ser Leu His Asn Gly Phe Arg Ser Ser Val Ala Arg Gly
245 250 255

US seq list.ST25.txt

Leu Glu Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ala Lys Met
260 265 270

Leu Lys Met Val Tyr Asp Cys Glu Val Glu Ala Ser Ala Ile Arg His
275 280 285

Gly Asn Lys Cys Val Tyr Gln His Ser Ser Gly Asn Asp Arg Pro Gly
290 295 300

Leu Gly Glu Asn Ile Tyr Lys Thr Ser Val Gln Lys Phe Glu Lys Asn
305 310 315 320

Lys Ala Ala Lys Gln Ala Ser Glu Leu Trp Trp Asn Glu Leu Arg Glu
325 330 335

Phe Gly Val Gly Pro Ser Asn Asn Leu Thr Asn Ala Leu Trp Asn Arg
340 345 350

Pro Gly Met Gln Ile Gly His Tyr Thr Gln Met Ala Trp Asp Thr Thr
355 360 365

Tyr Lys Leu Gly Cys Ala Val Val Phe Cys Asn Asp Phe Thr Phe Gly
370 375 380

Val Cys Gln Tyr Gly Pro Gly Asn Tyr Met Asn His Leu Ile Tyr
385 390 395 400

Thr Met Gly Gln Pro Cys Ser Gln Cys Ala Ala Thr Ala Thr Cys Ser
405 410 415

Val Thr Glu Gly Leu Cys Ser Ala Pro
420 425

<210> 68
<211> 216
<212> PRT
<213> Ancylostoma duodenale

<400> 68

Met Leu Val Pro Val Ala Leu Leu Ala Leu Leu Ala Val Ala Val Glu
1 5 10 15

Gly Asn Ser Met Arg Cys Gly Asn Asn Gly Met Thr Asp Glu Ala Arg
20 25 30

Gln Glu Phe Leu Asp Val His Asn Gly Tyr Arg Ser Lys Val Ala Lys
35 40 45

US seq list.ST25.txt

Gly Gln Ala Lys Asp Ala Leu Gly Gly Asn Ala Pro Lys Ala Ala Lys
50 55 60

Met Lys Lys Met Ile Tyr Asp Cys Asn Val Glu Ser Thr Ala Met Gln
65 70 75 80

Asp Ala Lys Lys Cys Val Phe Ala His Ser His Lys Gly Leu Gly Glu
85 90 95

Asn Ile Tyr Met Ser Thr Ala Arg Gln Met Asp Lys Ala Glu Ala Ala
100 105 110

Gln Gln Ala Ser Asp Gly Trp Phe Ala Glu Leu Ala Lys Tyr Gly Val
115 120 125

Gly Gln Glu Asn Lys Leu Thr Met Gln Leu Trp Asn Arg Gly Val Met
130 135 140

Ile Gly His Tyr Thr Gln Met Val Trp Gln Glu Ser Tyr Lys Leu Gly
145 150 155 160

Cys Tyr Val Glu Trp Cys Pro Ser Met Thr Tyr Gly Val Cys Gln Tyr
165 170 175

Ser Pro Gln Gly Asn Met Met Asn Ser Ile Ile Tyr Glu Lys Gly Asn
180 185 190

Pro Cys Thr Gln Asp Ser Asp Cys Gly Ser Asn Ala Lys Cys Ser Ser
195 200 205

Gly Glu Ala Leu Cys Ile Val Gln
210 215

<210> 69
<211> 207
<212> PRT
<213> Necator americanus

<400> 69

Met Ser Ser Ile Thr Cys Leu Val Leu Leu Ser Ile Ala Ala Tyr Ser
1 5 10 15

Lys Ala Gly Cys Pro Asp Asn Gly Met Ser Glu Glu Ala Arg Gln Lys
20 25 30

Phe Leu Glu Leu His Asn Ser Leu Arg Ser Ser Val Ala Leu Gly Gln
35 40 45

US seq list.ST25.txt

Ala Lys Asp Gly Ala Gly Gly Asn Ala Pro Lys Ala Ala Lys Met Lys
 50 55 60

Thr Met Ala Tyr Asp Cys Glu Val Glu Lys Thr Ala Met Asn Asn Ala
 65 70 75 80

Lys Gln Cys Val Phe Lys His Ser Gln Pro Asn Gln Arg Lys Gly Leu
 85 90 95

Gly Glu Asn Ile Phe Met Ser Ser Asp Ser Gly Lys Ala Lys Ala Ala
 100 105 110

Glu Gln Ala Ser Lys Ala Trp Phe Gly Glu Leu Ala Glu Lys Gly Val
 115 120 125

Gly Gln Asn Leu Lys Leu Thr Gly Gly Leu Phe Ser Arg Gly Val Gly
 130 135 140

His Tyr Thr Gln Met Val Trp Gln Glu Thr Val Lys Leu Gly Cys Tyr
 145 150 155 160

Val Glu Ala Cys Ser Asn Met Cys Tyr Val Val Cys Gln Tyr Gly Pro
 165 170 175

Ala Gly Asn Met Met Gly Lys Asp Ile Tyr Glu Lys Gly Glu Pro Cys
 180 185 190

Ser Lys Cys Glu Asn Cys Asp Lys Glu Lys Gly Leu Cys Ser Ala
 195 200 205

<210> 70
 <211> 31
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic oligonucleotide primer

<400> 70
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31

<210> 71
 <211> 28
 <212> DNA
 <213> Artificial

<220>
 <223> Synthetic oligonucleotide primer

<400> 71
 tgtctagagg agcactgcac aatccttc

28

US seq list.ST25.txt

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<223> Synthetic oligonucleotide primer	
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<210> 73	
<211> 26	
<212> DNA	
<213> Artificial	
<220>	
<223> Synthetic oligonucleotide primer	
<400> 73	
tgtctagacc atgcacgatg caaagc	26
<210> 74	
<211> 21	
<212> DNA	
<213> Artificial	
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<223> Synthetic oligonucleotide primer	
<400> 74	
gcaaatggca ttctgacatc c	21
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<212> DNA	
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<223> Synthetic oligonucleotide primer	
<400> 75	
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<210> 76	
<211> 678	
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<213> Ancylostoma caninum	
<400> 76	
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caacggacgt ggcctcggcg aatgcgcgcg tcagttttc gctttgctg accaacaata	120
tgaggatatt cgtgttacac atgaggattt ccccgagata aaaccaaatt tgccatttgg	180
acaactgccc ctgcttaacg aggatggtaa agaactcgct cagtcaaacg ccatcaatcg	240

US seq list.ST25.txt

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gtatggacat cagaaattcg gtgacctgga gacgctaaaa	aaggatgtga tgcttcctgc	420
acgagacaag ttcctcggtt tcatcaccaa attcttaaag	aacaacccat caggattctt	480
ggttggtgac tcggtgactt ggatagatct gttgcttgct	gaacatgctt ccgacataca	540
gtcaaaggc cccgaataacc tcgaagggtt tcctgaggtg	aaggctcata tggaaaaggt	600
gcatctatt ccgaaactga aaaaatggat cgagaccaga	ccggagactc acttctgatc	660
gatacgcggg attttttc		678

<210> 77

<211> 207

<212> PRT

<213> Ancylostoma caninum

<400> 77

Met Val His Tyr Lys Leu Thr Tyr Phe Asn Gly Arg Gly Leu Gly Glu
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Cys Ala Arg Gln Leu Phe Ala Leu Ala Asp Gln Gln Tyr Glu Asp Ile
 20 25 30

Arg Val Thr His Glu Asp Phe Pro Glu Ile Lys Pro Asn Leu Pro Phe
 35 40 45

Gly Gln Leu Pro Leu Leu Asn Glu Asp Gly Lys Glu Leu Ala Gln Ser
 50 55 60

Asn Ala Ile Asn Arg Tyr Leu Ala Arg Lys Phe Gly Phe Ala Gly Lys
 65 70 75 80

Thr Pro Phe Glu Glu Ala Leu Val Asp Ser Leu Ala Asp Gln Met Thr
 85 90 95

Asp Tyr Arg Val Glu Ile Lys Pro Phe Val Tyr Thr Ala Tyr Gly His
 100 105 110

Gln Lys Phe Gly Asp Leu Glu Thr Leu Lys Lys Asp Val Met Leu Pro
 115 120 125

Ala Arg Asp Lys Phe Leu Gly Phe Ile Thr Lys Phe Leu Lys Asn Asn
 130 135 140

Pro Ser Gly Phe Leu Val Gly Asp Ser Val Thr Trp Ile Asp Leu Leu
 145 150 155 160

US seq list.ST25.txt

Leu Ala Glu His Ala Ser Asp Ile Gln Ser Lys Val Pro Glu Tyr Leu
165 170 175

Glu Gly Phe Pro Glu Val Lys Ala His Met Glu Lys Val Arg Ser Ile
180 185 190

Pro Lys Leu Lys Lys Trp Ile Glu Thr Arg Pro Glu Thr His Phe
195 200 205

<210> 78

<211> 16

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide primer

<400> 78

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16

<210> 79

<211> 21

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide primer

<400> 79

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21

<210> 80

<211> 28

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide primer

<400> 80

gggaattcaa ttctatgaga tgcggaaa

28

<210> 81

<211> 28

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide primer

<400> 81

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28

<210> 82

<211> 753

US seq list.ST25.txt

<212> DNA

<213> Necator americanus

<400> 82

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caaagccgg tgcctgaca atgaaatgtc agaggaagca cggcaaaaat tccttgaatt	120
gcacaattcg ttgagaagtt cggttgcatt gggacaggcc aaggatggag ctggtgaaa	180
tgccccgaaa gctgctaaga tgaagacgt ggcatacgat tgcgaagttt aaaagactgc	240
aatgaataac gcgaaacaat gtgtattcaa gcactcgaa cctaaccaaa ggaaaggatt	300
gggagagaat atatttatgt cttcgatag cggtatggac aaagcaaagg ctgctgagca	360
ggctagcaaa gcttggttcg gcgaacttgc agaaaaagga gttggacaga atcttaagct	420
tacaggaggc ttgttcagca gaggagtcgg gcactataca cagatggat ggcaagaaac	480
cgttaagctt ggatgctatg tggaagcgtg ctcaaataatg tttatgtgg tgtgccagta	540
cggtcctgct ggaaatatga tggcaagga tatctacgag aaaggagaac cgtgttcgaa	600
atgtgagaat tgcgacaagg agaaggact ctgcgtgct tgatttagtt tgttcagtga	660
agctcattac gtcacatac tttaacaaat cgtgtgatc tgttagttgct ttaatattca	720
aataaacatg atgccagcaa aaaaaaaaaaaa aaa	753

<210> 83

<211> 1134

<212> DNA

<213> Necator americanus

<400> 83

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tctgtttcgc tgggtgagcc gacaggcata ggtgagtttcc ttgctcaacc agcacctgca	120
tatgctagaa gactcacagg gcaggccctt gttgactacg tcaattcgca ccactcattt	180
tacaaggcca aatattcacc agatgctcaa gaacgcata aatctagaat tatggatttg	240
agtttcatgg ttgatgcgga agtcatgtatg gaagaaatgg accagcagga ggtatagat	300
ctcgctgttt cttaacctga aagtttcgac gctcgtaaa aatggccaga atgtccttca	360
ataggattaa tccgtatca gtccgcccggt ggaggatgtt gggcagtatc ctcagcagag	420
gtgatgaccg acaggatctg tatacatca aatggaaacaa agcagggtta tggatccgaa	480
acggatatct tatcatgctg tggacaacgt tgcgttagcg ggtgtacctc aggtgtgcca	540
cgtcaagctt tcaactatgc aattcgtaaa ggtgtttgca gtggaggacc atatggaaacg	600
aagggtgttt gcaaacccta tccttctat ccatgcggct atcatgctca tctgccat	660
tatggaccat gtccagatgg tatgtggcct acgccaacat gcgaaaaggc atgtcaatcc	720
gactatactg ttccgtacaa cgatgacagg atcttcggca gcaaaaactat tgtcttgacg	780

US seq list.ST25.txt

ggagagggaaa	aaattaagcg	agagatttc	aataacggac	cattggtagc	cacgtataca	840
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acaggcgcac	atgcagtcaa	aattattggc	tggggtgaag	aaaatggagt	caagtattgg	960
ttgattgcaa	actcgtggaa	cactgattgg	ggagagaatg	gcttcttccg	catgcttcgt	1020
ggaacaaacc	tttgcgatat	tgaactaagc	gcgactggag	gaacgttcaa	ggtgtgaacg	1080
tgatcgaaaa	gaacgattt	gaacaaaaat	cttccgtat	tgtcatcaa	aaaa	1134

<210> 84
 <211> 347
 <212> PRT
 <213> Necator americanus
 <400> 84

Met Leu Thr Leu Ala Ala Leu Leu Ile Ser Val Ser Leu Val Glu Pro
 1 5 10 15

Thr Gly Ile Gly Glu Phe Leu Ala Gln Pro Ala Pro Ala Tyr Ala Arg
 20 25 30

Arg Leu Thr Gly Gln Ala Leu Val Asp Tyr Val Asn Ser His His Ser
 35 40 45

Leu Tyr Lys Ala Lys Tyr Ser Pro Asp Ala Gln Glu Arg Met Lys Ser
 50 55 60

Arg Ile Met Asp Leu Ser Phe Met Val Asp Ala Glu Val Met Met Glu
 65 70 75 80

Glu Met Asp Gln Gln Glu Asp Ile Asp Leu Ala Val Ser Leu Pro Glu
 85 90 95

Ser Phe Asp Ala Arg Glu Lys Trp Pro Glu Cys Pro Ser Ile Gly Leu
 100 105 110

Ile Arg Asp Gln Ser Ala Gly Gly Cys Trp Ala Val Ser Ser Ala
 115 120 125

Glu Val Met Thr Asp Arg Ile Cys Ile Gln Ser Asn Gly Thr Lys Gln
 130 135 140

Val Tyr Val Ser Glu Thr Asp Ile Leu Ser Cys Cys Gly Gln Arg Cys
 145 150 155 160

Gly Ser Gly Cys Thr Ser Gly Val Pro Arg Gln Ala Phe Asn Tyr Ala
 165 170 175

US seq list.ST25.txt

Ile Arg Lys Gly Val Cys Ser Gly Gly Pro Tyr Gly Thr Lys Gly Val
180 185 190

Cys Lys Pro Tyr Pro Phe Tyr Pro Cys Gly Tyr His Ala His Leu Pro
195 200 205

Tyr Tyr Gly Pro Cys Pro Asp Gly Met Trp Pro Thr Pro Thr Cys Glu
210 215 220

Lys Ala Cys Gln Ser Asp Tyr Thr Val Pro Tyr Asn Asp Asp Arg Ile
225 230 235 240

Phe Gly Ser Lys Thr Ile Val Leu Thr Gly Glu Glu Lys Ile Lys Arg
245 250 255

Glu Ile Phe Asn Asn Gly Pro Leu Val Ala Thr Tyr Thr Val Tyr Glu
260 265 270

Asp Phe Ala Tyr Tyr Lys Asn Gly Ile Tyr Met Thr Gly Leu Gly Arg
275 280 285

Ala Thr Gly Ala His Ala Val Lys Ile Ile Gly Trp Gly Glu Glu Asn
290 295 300

Gly Val Lys Tyr Trp Leu Ile Ala Asn Ser Trp Asn Thr Asp Trp Gly
305 310 315 320

Glu Asn Gly Phe Phe Arg Met Leu Arg Gly Thr Asn Leu Cys Asp Ile
325 330 335

Glu Leu Ser Ala Thr Gly Gly Thr Phe Lys Val
340 345

<210> 85
<211> 1177
<212> DNA
<213> Neca

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tttctgaaca aacgacaatc gtttttcacg gctaagtaca cgccaaatgc tttaaacatt 180
cttaaaatgc gtgtgtatgga atcgagattc ctggacaatg aagaaggtga aatgctaaaa 240
gaggaggaca tggatTTcag tgaagaatt cctgttagtt ttgatgctcg agacaaatgg 300
cccaaATgcA cctccatagg atttatccgt gatcaatcac actgtggttc atgctggcA 360
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US seq list.ST25.txt

gtatcgtag cagaaacgat gtcagatcga ctctgcgtgc aatcaaacgg tacaattaag	420
gtacttctat ccgatacgga catccttgcc tggatgtgga	480
ggaggccaca caattcgagc gtggaaat tttaaagaaca caggcggtt cactggcgga	540
ctatatggaa caaaggattc ctgcaaacc aacccatgtaa agacgaaagt	600
tacggaaagt gccccaaagga ttctttcca acacccaaat gtcgaaaaat ttgtcagtat	660
aaatacagta agaagtacgc cgacgacaaa tactacgcga attccgcata tcgaattcca	720
cagaatgaga cgtggatcaa attggagatc atgagaaacg ggcctgtgac agcatcattc	780
aggatttatac cggattttgg gtttacgaa aaaggagttt atgtgacttc aggccgaaagg	840
gaactaggtg ggcacgcgat taaaatcatt ggatgggaa cggaaaaagt aaacggaact	900
gacctacctt actgggttgc tgctaactct tgggtactg actggggaga gaataacggc	960
tatcccgca tactcgcgg acaaaatcac tgccaaatag aacagaaagt tatcgccggt	1020
atgataaaag taccacaacc gaaatccgcc ggtccaccac ttcaacccaa tccttcaagc	1080
tgaaccaagt tgttagtattg tccccatcaa tccaaaggatt tcttgggtg atactttac	1140
gaataaaaaac tacattataa aaaaaaaaaa aaaaaaaaaa	1177

<210> 86

<211> 360

<212> PRT

<213> Necator americanus

<400> 86

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 20 25 30

Leu Ser Gly Glu Ala Phe Ala Glu Phe Leu Asn Lys Arg Gln Ser Phe
 35 40 45

Phe Thr Ala Lys Tyr Thr Pro Asn Ala Leu Asn Ile Leu Lys Met Arg
 50 55 60

Val Met Glu Ser Arg Phe Leu Asp Asn Glu Glu Gly Glu Met Leu Lys
 65 70 75 80

Glu Glu Asp Met Asp Phe Ser Glu Glu Ile Pro Val Ser Phe Asp Ala
 85 90 95

Arg Asp Lys Trp Pro Lys Cys Thr Ser Ile Gly Phe Ile Arg Asp Gln
 100 105 110

US seq list.ST25.txt

Ser His Cys Gly Ser Cys Trp Ala Val Ser Ser Ala Glu Thr Met Ser
115 120 125

Asp Arg Leu Cys Val Gln Ser Asn Gly Thr Ile Lys Val Leu Leu Ser
130 135 140

Asp Thr Asp Ile Leu Ala Cys Cys Pro Asn Cys Gly Ala Gly Cys Gly
145 150 155 160

Gly Gly His Thr Ile Arg Ala Trp Glu Tyr Phe Lys Asn Thr Gly Val
165 170 175

Cys Thr Gly Gly Leu Tyr Gly Thr Lys Asp Ser Cys Lys Pro Tyr Ala
180 185 190

Phe Tyr Pro Cys Lys Asp Glu Ser Tyr Gly Lys Cys Pro Lys Asp Ser
195 200 205

Phe Pro Thr Pro Lys Cys Arg Lys Ile Cys Gln Tyr Lys Tyr Ser Lys
210 215 220

Lys Tyr Ala Asp Asp Lys Tyr Tyr Ala Asn Ser Ala Tyr Arg Ile Pro
225 230 235 240

Gln Asn Glu Thr Trp Ile Lys Leu Glu Ile Met Arg Asn Gly Pro Val
245 250 255

Thr Ala Ser Phe Arg Ile Tyr Pro Asp Phe Gly Phe Tyr Glu Lys Gly
260 265 270

Val Tyr Val Thr Ser Gly Gly Arg Glu Leu Gly Gly His Ala Ile Lys
275 280 285

Ile Ile Gly Trp Gly Thr Glu Lys Val Asn Gly Thr Asp Leu Pro Tyr
290 295 300

Trp Leu Ile Ala Asn Ser Trp Gly Thr Asp Trp Gly Glu Asn Asn Gly
305 310 315 320

Tyr Phe Arg Ile Leu Arg Gly Gln Asn His Cys Gln Ile Glu Gln Lys
325 330 335

Val Ile Ala Gly Met Ile Lys Val Pro Gln Pro Lys Ser Ala Gly Pro
340 345 350

Pro Leu Gln Pro Asn Pro Ser Ser
355 360

US seq list.ST25.txt

<210> 87
<211> 1181
<212> DNA
<213> Necator americanus

<400> 87
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gtcgtcgtcc ttctggcaat aaaccagttt tatgcagatg agctgcttca caaacaagag 180
tccgaacacg gacttagtgg ccaagcgctc gttgactacg ttaattcgca ccaatcactt 240
ttcaaaaacag aatattcgcc aaccaatgaa caattcgta aagccgtat aatggacata 300
aagtatatga ctgaggctag ccacaaatat ccaagaaagg gcattaatctt gaacgttgaa 360
ctccctgaaa ggtttgacgc acgtgaaaaa tggccacatt gcgcctccat cggtctcatt 420
cgcgatcaact ctgcttgcgg atcgtgttgg gctgtatcgg cagcgtcggt tatgtcagat 480
cgactctgtt tccagacgaa cggcacaaac cagaagatcc tttcgtcggc ggacatcctt 540
gcgtgttgcg gagaagactg tggctcagga tgcgaaggcg gttatccgat tcaggcgtac 600
ttctacctgg aaaatactgg agtatgtagt ggaggagagt atcgagaaaa gaatgtatgc 660
aaaccatatc cttttatcc gtgtgacgga aactatggac catgccccaa ggagggtgcg 720
ttcgacactc caaagtgtcg gaaaatatgt cagttccgat atcctgttcc atacgaagaa 780
gataaagtgt ttggaaaaaa ttcacacatc cttctgcaag acaacgaggc aagaatcaga 840
cagggaaattt tcataaacgg accagtggga gctaattttt acgtttcga agactttata 900
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aaacttattt gttggggcac agaaaatgga acagatttattt ggttgggtgc taactcgtac 1020
aactacgact ggggagagaa tggcaccttc cgcatttttc gtggactaa tcactgtttg 1080
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gcatgccat ctctgaagta aaatgtgtta atcaaaaaaa a 1181

<210> 88
<211> 339
<212> PRT
<213> Necator americanus

<400> 88

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1 5 10 15

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20 25 30

US seq list.ST25.txt

Ser Gly Gln Ala Leu Val Asp Tyr Val Asn Ser His Gln Ser Leu Phe
35 40 45

Lys Thr Glu Tyr Ser Pro Thr Asn Glu Gln Phe Val Lys Ala Arg Ile
50 55 60

Met Asp Ile Lys Tyr Met Thr Glu Ala Ser His Lys Tyr Pro Arg Lys
65 70 75 80

Gly Ile Asn Leu Asn Val Glu Leu Pro Glu Arg Phe Asp Ala Arg Glu
85 90 95

Lys Trp Pro His Cys Ala Ser Ile Gly Leu Ile Arg Asp His Ser Ala
100 105 110

Cys Gly Ser Cys Trp Ala Val Ser Ala Ala Ser Val Met Ser Asp Arg
115 120 125

Leu Cys Ile Gln Thr Asn Gly Thr Asn Gln Lys Ile Leu Ser Ser Ala
130 135 140

Asp Ile Leu Ala Cys Cys Gly Glu Asp Cys Gly Ser Gly Cys Glu Gly
145 150 155 160

Gly Tyr Pro Ile Gln Ala Tyr Phe Tyr Leu Glu Asn Thr Gly Val Cys
165 170 175

Ser Gly Gly Glu Tyr Arg Glu Lys Asn Val Cys Lys Pro Tyr Pro Phe
180 185 190

Tyr Pro Cys Asp Gly Asn Tyr Gly Pro Cys Pro Lys Glu Gly Ala Phe
195 200 205

Asp Thr Pro Lys Cys Arg Lys Ile Cys Gln Phe Arg Tyr Pro Val Pro
210 215 220

Tyr Glu Glu Asp Lys Val Phe Gly Lys Asn Ser His Ile Leu Leu Gln
225 230 235 240

Asp Asn Glu Ala Arg Ile Arg Gln Glu Ile Phe Ile Asn Gly Pro Val
245 250 255

Gly Ala Asn Phe Tyr Val Phe Glu Asp Phe Ile His Tyr Lys Glu Gly
260 265 270

Ile Tyr Lys Gln Thr Tyr Gly Lys Trp Ile Gly Val His Ala Ile Lys
275 280 285

US seq list.ST25.txt

Leu Ile Gly Trp Gly Thr Glu Asn Gly Thr Asp Tyr Trp Leu Val Ala
290 295 300

Asn Ser Tyr Asn Tyr Asp Trp Gly Glu Asn Gly Thr Phe Arg Ile Leu
305 310 315 320

Arg Gly Thr Asn His Cys Leu Ile Glu Ser Gln Val Ile Ala Thr Glu
325 330 335

Met Ile Val

<210> 89
<211> 1236
<212> DNA
<213> Necator americanus

<400> 89
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caaacattca agagaagcat gataaccatc attaccctat tgcttatcgc ttctacagt 180
aagtcaactaa cagtggagga gtacttggcc cgaccagtgc cgaaatatgc cacaactg 240
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tccccgctgg ttgaacagta tgccaaagct gtgatgagat ctgagttat gacgaagccg 360
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gcaaggaaa aatggccaaa ctgcacatca ataaggacaa ttcgcgatca gtccaaattgt 480
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aacggcacaa tacagtcatg ggcttctgat acggatattc tatcatgttgc 600
ggaatggat gcgatggagg tagaccgtt gcggcgttct tttcgcgat agacaatggt 660
gtatgcactg gaggacctt cagagagcca aacgtgtcga aaccatacgc tttctatcca 720
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ccaaaatgtc ggaaaatgtg tcaactaaaa tataatgtgg cctacaaaga cgataaaatt 840
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ggagacgaag gctatgtccg gttccttcgt ggagataacc actgtggaat tgaatcaagg 1140
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US seq list.ST25.txt

taaaatctt gccactaaaa aaaaaaaaaa aaaaaa 1236

<210> 90
<211> 342
<212> PRT
<213> Necator americanus

<400> 90

Met Ile Thr Ile Ile Thr Leu Leu Leu Ile Ala Ser Thr Val Lys Ser
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Leu Thr Val Glu Glu Tyr Leu Ala Arg Pro Val Pro Glu Tyr Ala Thr
20 25 30

Lys Leu Thr Gly Gln Ala Tyr Val Asp Tyr Val Asn Gln His Gln Ser
35 40 45

Phe Tyr Lys Ala Glu Tyr Ser Pro Leu Val Glu Gln Tyr Ala Lys Ala
50 55 60

Val Met Arg Ser Glu Phe Met Thr Lys Pro Asn Gln Asn Tyr Val Val
65 70 75 80

Lys Asp Val Asp Leu Asn Ile Asn Leu Pro Glu Thr Phe Asp Ala Arg
85 90 95

Glu Lys Trp Pro Asn Cys Thr Ser Ile Arg Thr Ile Arg Asp Gln Ser
100 105 110

Asn Cys Gly Ser Cys Trp Ala Val Ser Ala Ala Ser Val Met Ser Asp
115 120 125

Arg Leu Cys Ile Gln Ser Asn Gly Thr Ile Gln Ser Trp Ala Ser Asp
130 135 140

Thr Asp Ile Leu Ser Cys Cys Trp Asn Cys Gly Met Gly Cys Asp Gly
145 150 155 160

Gly Arg Pro Phe Ala Ala Phe Phe Phe Ala Ile Asp Asn Gly Val Cys
165 170 175

Thr Gly Gly Pro Phe Arg Glu Pro Asn Val Cys Lys Pro Tyr Ala Phe
180 185 190

Tyr Pro Cys Gly Arg His Gln Asn Gln Lys Tyr Phe Gly Pro Cys Pro
195 200 205

US seq list.ST25.txt

Lys	Glu	Leu	Trp	Pro	Thr	Pro	Lys	Cys	Arg	Lys	Met	Cys	Gln	Leu	Lys
210						215					220				
Tyr	Asn	Val	Ala	Tyr	Lys	Asp	Asp	Lys	Ile	Tyr	Gly	Asn	Asp	Ala	Tyr
225					230				235			240			
Ser	Leu	Pro	Asn	Asn	Glu	Thr	Arg	Ile	Met	Gln	Glu	Ile	Phe	Thr	Asn
					245				250			255			
Gly	Pro	Val	Val	Gly	Ser	Phe	Ser	Val	Phe	Ala	Asp	Phe	Ala	Ile	Tyr
						260			265			270			
Lys	Lys	Gly	Val	Tyr	Val	Ser	Asn	Gly	Ile	Gln	Gln	Asn	Gly	Ala	His
						275		280				285			
Ala	Val	Lys	Ile	Ile	Gly	Trp	Gly	Val	Gln	Asp	Gly	Leu	Lys	Tyr	Trp
					295				300						
Leu	Ile	Ala	Asn	Ser	Trp	Asn	Asn	Asp	Trp	Gly	Asp	Glu	Gly	Tyr	Val
					305		310		315			320			
Arg	Phe	Leu	Arg	Gly	Asp	Asn	His	Cys	Gly	Ile	Glu	Ser	Arg	Val	Val
					325			330				335			
Thr	Gly	Thr	Met	Lys	Val										
					340										

<210> 91
<211> 2709
<212> DNA
<213> Necator americanus

<400> 91
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taaccacca agacctaagg agccactcag tcgtccagta gtgcaattgt cttcatctat 180
tcagactacc gtaaccgaaa atgttagtgac agaaccata gtgactgtgc cgacagtgtc 240
acgcaccaga gtttcggcaa aaacaatatc accgagaagt tccgcgacaa cgtcaactcg 300
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tttcacttgt aacaagttc taaaagatca taaggctgaa gaacatgggg tcagtcgtta 540
cgagactata aaagaacttc aagatgcagt gaacacagaa atagttgacg ccctcttcga 600
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US seq list.ST25.txt

cgactgcgtt taccacatct cgccataatgt tccgaccgaa acaatcatta atttccttga 720
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ctacgatctg cccacttga aaaaggcgta tccatctgtc aatgggaga gctatctacg 1200
tagcctttg tcaaccgtcg gtccagtcga ttttctggt ccacataaac ggctcataat 1260
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aatccttgag ctaccatcaga cggagaggag cagccttcga tattaccgtt tgcgcccgg 1860
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gtccaaatttc ctccatcac cagcgttagt gagcgctgg taccagccgg aaaggaactc 1980
tacactttc cttacgcga gcttcaatcc accgtactat agctatgaat atcctcaagc 2040
ttacaactat ggtggtcagg gtggaaactgc cggatgcgtt cttttgcagg atgcagacag 2100
ccaggagtg cagttcggtc ccgatggaag tctaagtagg tgtacgtgg atgattgtgg 2160
atggatggat aaaagatcaa aagatggttt caacgacatg gccaatgtg ttgtacacaca 2220
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aggtacatc aaatcactag gacatgaaga gaaaagattt ccaggattt aacgatacac 2400
acccaaaccag atcttttggg ttacatatgg atactcatgg tgcaggagcg taacagagga 2460
ataccttatt agtcaacttc tcaccgaccc ccacgcacca agtgcgttgc gcactaacc 2520

US seq list.ST25.txt
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gtatcctgca ccagagcagc gatgttcagt ttgggttcaa gagtaaatgg tcggacgaaa 2640
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aaaaaaaaaa 2709

<210> 92
<211> 878
<212> PRT
<213> Necator americanus

<400> 92

Met Thr Lys Leu Leu Val Ser Thr Ala Gly Leu Thr Gly Val Val Ala
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Ala Leu Phe Ile Thr Ser Leu Val Phe Ser Ile Leu Thr Trp Thr Arg
20 25 30

Val Lys Asn Asp Asn Asp Asn Pro Pro Arg Pro Lys Glu Pro Leu Ser
35 40 45

Arg Pro Val Val Gln Leu Ser Ser Ser Ile Gln Thr Thr Val Thr Glu
50 55 60

Asn Val Val Thr Glu Pro Ile Val Thr Val Pro Thr Val Ser Arg Thr
65 70 75 80

Arg Val Ser Ala Lys Thr Ile Ser Pro Arg Ser Ser Ala Thr Thr Ser
85 90 95

Thr Arg Thr Leu Arg Thr Leu Thr Thr Pro Lys Phe Val Ala Thr Glu
100 105 110

Ala Ala Pro Arg Arg Asn Arg Thr Ile Met Cys Pro Asn Tyr Gly Val
115 120 125

Ser Asp Asn Ser Tyr Ala Tyr Gln Glu Ala Ala Ser Phe Ile Leu Ser
130 135 140

Gly Leu Asp Glu Arg Val Asn Pro Cys Glu Asp Phe Tyr Ala Phe Thr
145 150 155 160

Cys Asn Lys Phe Leu Lys Asp His Lys Ala Glu Glu His Gly Val Ser
165 170 175

Arg Tyr Gly Ala Ile Lys Glu Leu Gln Asp Ala Val Asn Thr Glu Ile
180 185 190

US seq list.ST25.txt

Val Asp Ala Leu Phe Asp Val Asp Val Asn Asp Lys Lys Arg Ser Glu
195 200 205

Thr Glu Arg Ile Thr Lys Ala Leu Leu His Asp Cys Val Tyr His Ile
210 215 220

Ser Pro Asn Val Pro Thr Glu Thr Ile Ile Asn Phe Leu Glu Glu Ile
225 230 235 240

Ala Arg Met Phe Gly Gly Ile Pro Phe Leu Asn His Thr Leu Lys Glu
245 250 255

Asp Phe Asp Val Phe Ala Ala Met Gly Glu Val Glu Gln Asn His Ala
260 265 270

Met Gly Thr Leu Phe Ser Ala Met Val Ser Val Asp Tyr Lys Lys Ile
275 280 285

Lys Gln Asn Ser Leu Phe Leu Ser Gln Pro Arg Leu Pro Met Pro Arg
290 295 300

Glu Phe Tyr Val Leu Pro Gln Phe Thr Met Lys Leu Lys Lys Arg Gly
305 310 315 320

Leu Gln Ile Ala Asp Val Leu Lys Lys Phe Ala Glu Lys Ile Leu Glu
325 330 335

Glu Pro Asp Lys Tyr Arg Asp Met Ile Glu Lys Ala Ala Gln Asp Val
340 345 350

Val Glu Leu Glu Arg Arg Ile Ala Leu Ala Ser Trp Ala Asp Ala Glu
355 360 365

Met Arg Asn Tyr Ala Gln Gln Tyr Asn Pro Tyr Asp Leu Pro Thr Leu
370 375 380

Lys Lys Ala Tyr Pro Ser Val Lys Trp Glu Ser Tyr Leu Arg Ser Leu
385 390 395 400

Leu Ser Thr Val Gly Pro Val Asp Phe Ser Gly Pro His Lys Arg Leu
405 410 415

Ile Ile Ser Gln Pro Ser Tyr Phe Gly Trp Leu Asn Ala Leu Phe Asn
420 425 430

Gly Asn Val Val Asp Glu Asn Thr Ile Val Asn Tyr Ile Ile Thr His
435 440 445

US seq list.ST25.txt

Leu Ile Phe Glu Asp Ala Glu Phe Leu Gly Gly Ile Phe Lys Glu Ser
450 455 460

Ala Glu Asp Leu Asn Tyr Val Arg Tyr Ala Gln Arg Ser Gly Arg Gly
465 470 475 480

Val Ala Arg Val Gly Arg Gln Leu Met His Gln Arg Asp Thr Arg Gly
485 490 495

Asp Pro Asn Ile Pro Cys Met Asn Phe Ile Met Thr Tyr Met Pro Tyr
500 505 510

Gly Pro Gly Tyr Val Tyr Val Arg Ser Lys Gln Gln Arg Asn Asp Val
515 520 525

Gln Ala Asp Ile Arg Lys Gln Thr Glu Leu Val Ile Glu Ser Phe Leu
530 535 540

Asn Met Thr Ser Gly Leu Lys Trp Met Ser Ser Asp Ser Lys Glu Lys
545 550 555 560

Ala Arg Gln Lys Ala Lys Gly Met Val Arg Asn Tyr Gly Trp Pro Gln
565 570 575

Lys Leu Phe Gly Asp Phe Lys Ser Ser Glu Glu Ile Asp Glu Tyr His
580 585 590

Lys Lys Asp Tyr Ala Glu Ile Leu Glu Leu Thr Lys Thr Glu Arg Ser
595 600 605

Ser Leu Arg Tyr Tyr Arg Met Arg Arg Val Leu Ile Lys Gly Tyr Ser
610 615 620

Asn Arg Glu Ser Leu Arg Leu Leu Leu Gln Asp Ala Asp Arg Ser Asn
625 630 635 640

Phe Leu Leu Ser Pro Ala Leu Val Ser Ala Trp Tyr Gln Pro Glu Arg
645 650 655

Asn Ser Ile Thr Phe Pro Tyr Ala Ser Phe Asn Pro Pro Tyr Tyr Ser
660 665 670

Tyr Glu Tyr Pro Gln Ala Tyr Asn Tyr Gly Gly Gln Gly Thr Ala
675 680 685

Gly His Glu Leu Val His Gly Phe Asp Asp Gln Gly Val Gln Phe Gly
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US seq list.ST25.txt

690	695	700
Pro Asp Gly Ser Leu Ser Arg Cys Thr Ser Glu Gln Ile Asp Asn Trp		
705	710	715
720		
Tyr Asp Cys Gly Trp Met Asp Lys Arg Ser Lys Asp Gly Phe Asn Asp		
725	730	735
Met Ala Gln Cys Val Val Thr His Tyr Ser Thr Phe Cys Cys Pro Glu		
740	745	750
Gln Glu Gly Asn Ile His Cys Ala Asn Gly Ala Thr Thr Gln Gly Glu		
755	760	765
Asn Ile Ala Asp Ile Gly Glu His Ala Ala Tyr Ile Ala Tyr Arg		
770	775	780
Glu Tyr Ile Lys Ser Leu Gly His Glu Glu Lys Arg Leu Pro Gly Leu		
785	790	795
800		
Glu Arg Tyr Thr Pro Asn Gln Ile Phe Trp Ile Thr Tyr Gly Tyr Ser		
805	810	815
Trp Cys Arg Ser Val Thr Glu Glu Tyr Leu Ile Ser Gln Leu Leu Thr		
820	825	830
Asp Pro His Ala Pro Ser Ala Cys Arg Thr Asn Gln Val Val Gln Ser		
835	840	845
Ile Pro Ala Phe Gly Arg Asp Phe Gly Cys Ser Leu Gly Asp Arg Met		
850	855	860
Tyr Pro Ala Pro Glu Gln Arg Cys Ser Val Trp Val Gln Glu		
865	870	875
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<211> 551		
<212> DNA		
<213> Ancylostoma caninum		
<400> 93		
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tgaaggaatt cgacgctctt ttccggatg ctggaggtct gactgatgcc cagatcgacg 180		
ctaaggtaa gggatggatc ggaaagcaga gtcaggatat ccagaacgca ttcaatgcct 240		
tcgagagtga ggtgaaagcc gcccagcaac agggtgagca agctcaccag gctgctgtcg 300		

US seq list.ST25.txt
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 aaaaagtccg tgatgaaatc gagaatgcaa tgaagggata agagggcggtt gttttgtata 480
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 aaaaaaaaaa a 551

<210> 94
 <211> 147
 <212> PRT
 <213> Ancylostoma caninum

<400> 94

Met Leu Lys Leu Val Ala Leu Ala Cys Leu Ala Ala Ile Cys Leu Ala
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Gln Gly Gly Pro Glu Gly Pro Pro Pro Phe Leu Lys Ser Ala Pro Pro
 20 25 30

Glu Lys Val Lys Glu Phe Asp Ala Leu Phe Ala Asp Ala Gly Gly Leu
 35 40 45

Thr Asp Ala Gln Ile Asp Ala Lys Val Lys Gly Trp Ile Gly Lys Gln
 50 55 60

Ser Gln Asp Ile Gln Asn Ala Phe Asn Ala Phe Glu Ser Glu Val Lys
 65 70 75 80

Ala Ala Gln Gln Gln Gly Glu Gln Ala His Gln Ala Ala Val Ala Lys
 85 90 95

Phe Ser Ala Glu Ala Lys Ala Ala Asp Ala Lys Leu Thr Ala Ile Ala
 100 105 110

Asn Asp Ala Ser Lys Thr Asn Ala Gln Lys Gly Ala Glu Ile Asp Ala
 115 120 125

Val Leu Lys Gly Leu Pro Gln Lys Val Arg Asp Glu Ile Glu Asn Ala
 130 135 140

Met Lys Gly
 145

<210> 95
 <211> 482
 <212> DNA
 <213> Ancylostoma ceylanicum

US seq list.ST25.txt

<400> 95
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tgaaagccgc ccagcaacag ggtgagcaag ctcaccaggc tgctgtcgcc aaattcagcg 300
ctgaggccaa ggctgccgac gccaagctca ccgctatcgc caatgacgcc tccaagacga 360
atgcgcagaa gggagccgag atcgacgccc ttctcaaggg tcttccacaa aaagtccgtg 420
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<210> 96

<211> 147

<212> PRT

<213> Ancylostoma ceylanicum

<400> 96

Met Leu Lys Leu Val Ala Leu Ala Cys Leu Ala Ala Ile Cys Leu Ala
1 5 10 15

Gln Gly Gly Pro Glu Gly Pro Pro Pro Phe Leu Lys Ser Ala Pro Pro
20 25 30

Glu Lys Val Lys Glu Phe Asp Ala Leu Phe Ala Asp Ala Gly Gly Leu
35 40 45

Thr Asp Ala Gln Ile Asp Ala Lys Val Lys Gly Trp Ile Gly Lys Gln
50 55 60

Ser Gln Asp Ile Gln Asn Ala Phe Asn Ala Phe Glu Ser Glu Val Lys
65 70 75 80

Ala Ala Gln Gln Gln Gly Glu Gln Ala His Gln Ala Ala Val Ala Lys
85 90 95

Phe Ser Ala Glu Ala Lys Ala Ala Asp Ala Lys Leu Thr Ala Ile Ala
100 105 110

Asn Asp Ala Ser Lys Thr Asn Ala Gln Lys Gly Ala Glu Ile Asp Ala
115 120 125

Val Leu Lys Gly Leu Pro Gln Lys Val Arg Asp Glu Ile Glu Asn Ala
130 135 140

US seq list.ST25.txt

Met Lys Gly
145

<210> 97
<211> 1093
<212> DNA
<213> Ancylostoma caninum

<400> 97
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tttggact acatcaacga gcatcaatct ttctataggg cggaatattc accagaggcg 180
gaagcgttcg tgaaagctcg gataatggac tcgaagtatt tagtggacc taagaaagaa 240
gaagtgctgg aggacgtata tggcaatgat ccgcctgcga gcttcgacgc tcgcacccac 300
tggcctgaat gcagatccat tggcaccatt cgtgaccagt catcatgcgg ttcatgttgg 360
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tgccaaagggtg gttggccgat cgaagcatac aaatggatgc aacgtgacgg tggttaca 540
ggtgaaaaat acagacagaa gaaagtgtgc aagccgtacg cttctatcc gtgtggcac 600
cacaaaaatg acccctacta tggaccttgc ccagggggtt tatggccac tccaaaatgt 660
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gaatcattct gag 1093

<210> 98
<211> 343
<212> PRT
<213> Ancylostoma caninum

<400> 98

Met Trp Ile Leu Ala Ala Leu Val Val Thr Ala Leu Ala Ala Lys Pro
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Thr Thr Val Glu Glu Phe His Ala Gln Pro Ile Glu Glu His Val Lys
20 25 30

US seq list.ST25.txt

Asp Leu Ser Gly Gln Ala Phe Val Asp Tyr Ile Asn Glu His Gln Ser
35 40 45

Phe Tyr Arg Ala Glu Tyr Ser Pro Glu Ala Glu Ala Phe Val Lys Ala
50 55 60

Arg Ile Met Asp Ser Lys Tyr Leu Val Glu Pro Lys Lys Glu Glu Val
65 70 75 80

Leu Glu Asp Val Tyr Gly Asn Asp Pro Pro Ala Ser Phe Asp Ala Arg
85 90 95

Thr His Trp Pro Glu Cys Arg Ser Ile Gly Thr Ile Arg Asp Gln Ser
100 105 110

Ser Cys Gly Ser Cys Trp Ala Val Ser Ser Ala Glu Ala Met Ser Asp
115 120 125

Glu Ile Cys Val Gln Ser Asn Ser Thr Ile Arg Val Met Ile Ser Asp
130 135 140

Ser Asp Ile Leu Ser Cys Cys Gly Ile Ser Cys Gly Tyr Gly Cys Gln
145 150 155 160

Gly Gly Trp Pro Ile Glu Ala Tyr Lys Trp Met Gln Arg Asp Gly Val
165 170 175

Val Thr Gly Gly Lys Tyr Arg Gln Lys Lys Val Cys Lys Pro Tyr Ala
180 185 190

Phe Tyr Pro Cys Gly His His Gln Asn Asp Pro Tyr Tyr Gly Pro Cys
195 200 205

Pro Gly Gly Leu Trp Pro Thr Pro Lys Cys Arg Lys Thr Cys Gln Arg
210 215 220

Lys Tyr Asn Lys Ser Tyr Gln Glu Asp Lys His Phe Ala Thr Arg Ala
225 230 235 240

Tyr Tyr Leu Pro Asn Asn Glu Arg Asn Ile Arg Gln Glu Ile Tyr Lys
245 250 255

Asn Gly Pro Val Val Ala Ala Phe Arg Val Tyr Gln Asp Phe Ser Tyr
260 265 270

Tyr Lys Lys Gly Ile Tyr Val His Lys Trp Gly Gly Gln Thr Gly Ala
275 280 285

US seq list.ST25.txt

His Ala Val Lys Val Val Gly Trp Gly Arg Glu Asn Ala Thr Asp Tyr
290 295 300

Trp Leu Ile Ala Asn Ser Trp Asn Thr Asp Trp Gly Glu Ser Gly Tyr
305 310 315 320

Phe Arg Ile Val Arg Gly Thr Asn Glu Cys Gly Ile Glu Ala Gln Met
325 330 335

Val Gly Gly Ala Met Arg Val
340

<210> 99
<211> 495
<212> DNA
<213> Ancylostoma caninum

<400> 99
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gatcctgaac acatggctag agcatggaag gccgcaaaag gcatcaatga ggacgcttct 180
aacgctggac cgtaccacat gattcctatt aagatcgtaa aggccgaatc tcaagttgtc 240
gctggagttt ggtacatatt tgaagtgctg ttcggcgaat ccacgtgtaa gaaaggacat 300
atggctgcaa ccgaactttc tgcctccaac tgtgagctga aagaaggagg aaaccgagct 360
ctatacaaag ttgagctttg ggagaagcca tggaaaact tcgagcagtt caacgtggag 420
aagatccgaa atgttgccgc cggcgagcaa atctagccgc ttcttaaga cacctcactg 480
cgccggcgtc tata 495

<210> 100
<211> 143
<212> PRT
<213> Ancylostoma caninum

<400> 100

Met Pro Tyr Leu Ala Phe Ile Val Ala Leu Leu Ala Cys Thr Val Met
1 5 10 15

Ser Gly His Gly Gln Met Thr Gly Gly Leu Thr Lys Gln Asp Pro Asn
20 25 30

Asp Pro Glu His Met Ala Arg Ala Trp Lys Ala Ala Lys Gly Ile Asn
35 40 45

Glu Asp Ala Ser Asn Ala Gly Pro Tyr His Met Ile Pro Ile Lys Ile
Page 105

US seq list.ST25.txt

50

55

60

Val Lys Ala Glu Ser Gln Val Val Ala Gly Val Arg Tyr Ile Phe Glu
 65 70 75 80

Val Leu Phe Gly Glu Ser Thr Cys Lys Lys Gly His Met Ala Ala Thr
 85 90 95

Glu Leu Ser Ala Ser Asn Cys Glu Leu Lys Glu Gly Gly Asn Arg Ala
 100 105 110

Leu Tyr Lys Val Glu Leu Trp Glu Lys Pro Trp Glu Asn Phe Glu Gln
 115 120 125

Phe Asn Val Glu Lys Ile Arg Asn Val Ala Ala Gly Glu Gln Ile
 130 135 140

<210> 101

<211> 2540

<212> DNA

<213> Ancylostoma caninum

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	ccgcatttaa agaAGCCTTC aattgtccga aatcacctta cgcaccagat aaacactgta	180
	acgtctgggt atcggagcta gatacatcac atggtagcc caaggtaaaa acagagctga	240
	atatacgcc gcctccacag atcactccga acgacaagga aaagtatgtat gcccggcaagg	300
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	acaagtatgc ttgcggaaag taccaaaaag cggctccctt ccactatgcc gacgctaaaa	420
	acctcgttagc aatggctaac caattgacaa ataaggacta ccagaaagtt atcaagagct	480
	caacagcatt aaccaaggag aaggcgttct tcgatgcgtg cgtatgtca acgaaagact	540
	ctggtcacaa taatcagatc ctcatttcca ataattatct catgaaacga gtaaggaaat	600
	tggctgacta ccttggagct gagtttacct atgcacttgg cggcagatgt gagcgtatgc	660
	ccaataaggt tcagctggca aacgctttgg gttacctctc ctttggccatgg aacattcaaa	720
	cgttgtgac acctcttgc gacacatatt ggccagaccc gaataaaagga tacacgtatgt	780
	tcctcgatca gaatactgca tatacgatca agactttcta ccacccggat gctttcaaaa	840
	ccattaagga aaactatatt aattctgcga ctaaggatcat agaaacgttc gtaaaaactc	900
	agaataaaacc gattgatcct aaactcaagg ataaggatgag aggcctggtg gaatttgaac	960
	aatgatcgc gaacaaggatc agcaccgatg atgacacacg ccgaatctac ttgcgtatcat	1020

US seq list.ST25.txt

ggaatctcg aagcattagg gagctacaga accaattgg	tttcgttcatatgat tggcaa	1080
atatgaagat gttcccatg gttgcgcaaa acaagggtgca	atctgcggat ttcagagttt	1140
ccgtcatgga gccgggtcgag tacccaaca tgagtctgta	ttatgctgga tttgaca	1200
aaaaactagt gaactacttg tttatgcgc	tgctgctatc taatgctc	1260
cctatgccag cagttcaaa gagatgccgg aagaaccact	agttcttggcgaa	1320
gcaacatcca tttctcaaaa tccgacaccc ttactgatac	gcaagcgaat tgtgca	1380
tggcgaatga gctgatgatg tttgcgaatg gacgagttt	cgtcgactat gtgtatcc	1440
acgagaaata caaggaccta ataaggagca gtgctgg	tgtgatgcac aatgttatcc	1500
atgcttcca aagcatggtt gatcaacttg actggatgag	cgaagcaca aagagaaaag	1560
caatagaaaa gagcatgaat atcataacaa acatagctt	cccgattgg attatggaca	1620
acgcaaagtt ggacctgtat tacaaaagca tcaccc	cccaaccaag gaaaactact	1680
acgatatttg gacaaagctt accatattca atatagaagc	tcagtacaag cactaacaa	1740
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agccggaatt gaatacgatc acattccccg ctggaatact	tcgtcctcct tatttccatc	1860
ctgattggcc agcatcaatc aaatacggtg	gaattggct aatagcagga catgaactga	1920
ttcacggctt tgacgatcaa ggtttcagt ggggtccaaa	gggacacatc tcttacccag	1980
agaagaactg tattggatgg atggatgagc aatcaacgaa	aggttcaat cgcttggctc	2040
aatgtgtcat cgatgagtat agcacgttct gccc	cttga caacaggaca tacacacca	2100
attgtgtaa tggagcgcag acccaaggag agaacatgc	cgataatgga ggggtacacg	2160
cggcggtccg cgcttaccgt acacacatct ctct	caatgg accagatcca cagttc	2220
acagactgtt cggcagttc acacatgatc agctgttctt	cttgaacttc gcacagggtgt	2280
ggtgcgagaa acgacgagtc gatgacagac tttaccagca	gctcatggtt gaccccaact	2340
ctccagcgat gtaccgagtg ttccgtactc ttca	gactaacta tccggccttc agagccgcat	2400
tcaactgtcc gcttaattcg cgatacgctc ctaaggatca	ttgcaatggt tgggtgccga	2460
attatatgcc ataagaggaa gttcttc	ttt gaaaactacc tactcaacat aaataaaagtc	2520
tgtgattta aaaaaaaaaa		2540

<210> 102
 <211> 823
 <212> PRT
 <213> *Ancylostoma caninum*

<400> 102

Ser Phe Ala Arg Val Trp Cys Arg Lys Leu Gly Ser Thr Ser Ser Leu
 1 5 10 15

US seq list.ST25.txt

Leu Thr Arg Leu Leu Thr Asp Pro His Ser Pro Ala Pro Tyr Arg Val
20 25 30

Leu Gly Thr Leu Gln Asn Phe Pro Ala Phe Lys Glu Ala Phe Asn Cys
35 40 45

Pro Lys Ser Pro Tyr Ala Pro Asp Lys His Cys Asn Val Trp Val Ser
50 55 60

Glu Leu Asp Thr Ser His Gly Glu Pro Lys Val Lys Thr Glu Leu Asn
65 70 75 80

Ile Ala Ala Pro Pro Gln Ile Thr Pro Asn Asp Lys Glu Lys Tyr Asp
85 90 95

Ala Ala Lys Val Ala Ile Ser Phe Phe Gln Glu Ser Val Asn Thr Ser
100 105 110

Val Asp Pro Cys Glu Asp Phe Tyr Lys Tyr Ala Cys Gly Lys Tyr Gln
115 120 125

Lys Ala Val Ser Phe His Tyr Ala Asp Ala Lys Asn Leu Val Ala Met
130 135 140

Ala Asn Gln Leu Thr Asn Lys Asp Tyr Gln Lys Val Ile Lys Ser Ser
145 150 155 160

Thr Ala Leu Thr Lys Glu Lys Ala Phe Phe Asp Ala Cys Val Ala Ala
165 170 175

Thr Lys Asp Ser Gly His Asn Asn Gln Ile Leu Ile Ser Asn Asn Tyr
180 185 190

Leu Met Lys Arg Val Arg Lys Leu Ala Asp Tyr Leu Gly Ala Glu Phe
195 200 205

Thr Tyr Ala Leu Gly Gly Arg Val Glu Arg Leu Pro Asn Lys Val Gln
210 215 220

Leu Ala Asn Ala Leu Gly Tyr Leu Ser Phe Asp Gln Asn Ile Gln Thr
225 230 235 240

Leu Val Thr Pro Leu Val Asp Thr Tyr Trp Pro Asp Pro Asn Lys Gly
245 250 255

Tyr Thr Met Phe Leu Asp Gln Asn Thr Ala Tyr Met Ser Lys Thr Phe
260 265 270

US seq list.ST25.txt

Tyr His Pro Asp Ala Phe Lys Thr Ile Lys Glu Asn Tyr Ile Asn Ser
275 280 285

Ala Thr Lys Val Ile Glu Thr Phe Val Lys Thr Gln Asn Lys Pro Ile
290 295 300

Asp Pro Lys Leu Lys Asp Lys Val Arg Gly Leu Val Glu Phe Glu Gln
305 310 315 320

Met Ile Ala Asn Lys Tyr Ser Thr Asp Asp Asp Thr Arg Arg Ile Tyr
325 330 335

Leu Arg Ser Trp Asn Leu Arg Ser Ile Arg Glu Leu Gln Asn Gln Phe
340 345 350

Gly Phe Val Asp Trp Gln Thr Tyr Met Lys Met Val Pro Met Val Ala
355 360 365

Gln Asn Lys Val Gln Ser Ala Asp Phe Arg Val Ser Val Met Glu Pro
370 375 380

Gly Gln Tyr Ala Asn Met Ser Arg Asp Tyr Ala Gly Phe Asp Lys Glu
385 390 395 400

Lys Leu Val Asn Tyr Leu Phe Met Arg Leu Leu Leu Ser Asn Ala Gln
405 410 415

Tyr Leu Pro Thr Tyr Ala Ser Ser Phe Lys Glu Met Pro Glu Glu Pro
420 425 430

Leu Val Leu Gly Arg Lys Arg Arg Asn Ile His Phe Ser Lys Ser Asp
435 440 445

Thr Leu Thr Asp Thr Gln Ala Asn Cys Ala Lys Val Ala Asn Glu Leu
450 455 460

Met Met Phe Ala Asn Gly Arg Val Phe Val Asp Tyr Val Tyr Pro Asp
465 470 475 480

Glu Lys Tyr Lys Asp Leu Ile Arg Ser Ser Ala Gly Gly Val Met His
485 490 495

Asn Val Ile His Ala Phe Gln Ser Met Val Asp Gln Leu Asp Trp Met
500 505 510

Ser Glu Ala Thr Lys Arg Lys Ala Ile Glu Lys Ser Met Asn Ile Ile
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US seq list.ST25.txt

515	520	525
Thr Asn Ile Ala Phe Pro Asp Trp Ile Met Asp Asn Ala Lys Leu Asp		
530	535	540
Leu Tyr Tyr Lys Ser Ile Thr Phe Asp Pro Thr Lys Glu Asn Tyr Tyr		
545	550	555 560
Asp Ile Trp Thr Lys Leu Thr Ile Phe Asn Ile Glu Ala Gln Tyr Lys		
565	570	575
His Leu Thr Met Ala Thr Ala Asp Tyr Glu Glu Phe Leu Met Pro Pro		
580	585	590
Gly Ile Val Asn Ala Trp Tyr Gln Pro Glu Leu Asn Thr Ile Thr Phe		
595	600	605
Pro Ala Gly Ile Leu Arg Pro Pro Tyr Phe His Pro Asp Trp Pro Ala		
610	615	620
Ser Ile Lys Tyr Gly Gly Ile Gly Leu Ile Ala Gly His Glu Leu Ile		
625	630	635 640
His Gly Phe Asp Asp Gln Gly Val Gln Trp Gly Pro Lys Gly His Ile		
645	650	655
Ser Tyr Pro Glu Lys Asn Cys Ile Gly Trp Met Asp Glu Gln Ser Thr		
660	665	670
Lys Gly Phe Asn Arg Leu Ala Gln Cys Val Ile Asp Glu Tyr Ser Thr		
675	680	685
Phe Cys Pro Leu Asp Asn Arg Thr Tyr Thr Pro Asn Cys Val Asn Gly		
690	695	700
Ala Gln Thr Gln Gly Glu Asn Ile Ala Asp Asn Gly Gly Val His Ala		
705	710	715 720
Ala Phe Arg Ala Tyr Arg Thr His Ile Ser Leu Asn Gly Pro Asp Pro		
725	730	735
Gln Leu Pro Asp Arg Leu Phe Gly Gln Phe Thr His Asp Gln Leu Phe		
740	745	750
Phe Leu Asn Phe Ala Gln Val Trp Cys Glu Lys Arg Arg Val Asp Asp		
755	760	765

US seq list.ST25.txt
Arg Leu Tyr Gln Gln Leu Met Val Asp Pro His Ser Pro Ala Met Tyr
770 775 780

Arg Val Phe Gly Thr Leu Gln Asn Tyr Pro Ala Phe Arg Ala Ala Phe
785 790 795 800

Asn Cys Pro Leu Asn Ser Arg Tyr Ala Pro Lys Asp His Cys Asn Val
805 810 815

Trp Val Pro Asn Tyr Met Pro
820

<210> 103
<211> 472
<212> DNA
<213> Ancylostoma caninum

<400> 103
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gcagaacgtc accgtcaagg ggaccaccat ctgcaacaag aagcgaatgg ccgatgtgac
ggtggactg tgggagagag acaccctcga ccccaacgac ctcctcgact ccaagaagac 120
ctctagggaa ggcgagttcc tcgggaaagg tggtcagaac gaagtcggct cgattgagcc
attcctcaaa attacacaca cctgcaatgt caagaaaccg ggctgcaaga gaatcactga 180
gttcgacatc ccgaagtcga agatcgacac ggtctacgac atgacctacg tgacgctgga
tatcatttcc gcagtcgata aggagaagtg ctacatgaac gcgttgttt ccacggcaat 240
attttgtata gacagatgaa cattccttcc gaaaaaaaaa aaaaaaaaaa aa 300
420
472

<210> 104
<211> 144
<212> PRT
<213> Ancylostoma caninum

<400> 104

Met Arg Ser Leu Cys Leu Leu Leu Ala Val Val Leu Val Ala Val His
1 5 10 15

Ala Lys Met Gln Asn Val Thr Val Lys Gly Thr Thr Ile Cys Asn Lys
20 25 30

Lys Arg Met Ala Asp Val Thr Val Glu Leu Trp Glu Arg Asp Thr Leu
35 40 45

Asp Pro Asn Asp Leu Leu Asp Ser Lys Lys Thr Ser Arg Glu Gly Glu
50 55 60

Phe Leu Gly Lys Gly Gly Gln Asn Glu Val Gly Ser Ile Glu Pro Phe
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65

70

US seq list.ST25.txt

75

80

Leu Lys Ile Thr His Thr Cys Asn Val Lys Lys Pro Gly Cys Lys Arg
 85 90 95

Ile Thr Glu Phe Asp Ile Pro Lys Ser Lys Ile Asp Thr Val Tyr Asp
 100 105 110

Met Thr Tyr Val Thr Leu Asp Ile Ile Ser Ala Val Asp Lys Glu Lys
 115 120 125

Cys Tyr Met Asn Ala Leu Phe Ser Thr Ala Ile Phe Cys Ile Asp Arg
 130 135 140

<210> 105

<211> 1442

<212> DNA

<213> Ancylostoma ceylanicum

<400> 105

agtgcattt	ccgagggatg	gctcgcttg	tactgttact	cgcaactattt	accctggctg	60
tggccagcgt	ccacaggagg	acattccacc	agccgcgtcg	ttacgtgaag	tcgggtgcgc	120
tttcgcgtca	accaacactt	cgtgaacgat	tgctggaaac	tggcagttgg	gaggactacc	180
agaagcaacg	ctatcactac	cagaagaaac	ttctggcaaa	atatgcggca	aacaaggcgt	240
cgaaactaca	gtccaccaat	gagattgacg	agtccttcg	taactatatg	gatgcacaat	300
atttcggcac	catccaaatc	ggaactccag	cgcagaattt	cacagtgattt	ttcgacaccg	360
gttcatccaa	cctctgggtg	ccgtccagga	aatgccattt	ctacgacatc	gcgtgcacatgc	420
ttcaccaccg	ctacgattct	ggagcatcgt	caacgtacaa	ggaggatgga	cgtaagatgg	480
ctattcaata	tggaactggc	tcaatgaagg	gcttcatttc	taaggataat	gtctgcacatgc	540
ccgaaattt	tgctgtcgag	caaccgttt	ccgaggcaac	gagcgagcca	ggcctcacgt	600
tcatcgctgc	gaagttcgac	ggaatcctt	gcatggcattt	ccctgaaatc	tccgttctcg	660
gtgtaccacc	agtattccac	acgttcattt	aacagaagaa	agtgccgagc	ccgggtttcg	720
ctttctggct	caacagaaat	cccgactcgg	aactcggagg	ggagatcacc	ctcggtggaa	780
tggacccccc	ccgatatat	gagccgatca	catggacccc	agtaactcga	cgaggatatt	840
ggcagttcaa	gatggacaag	gttcaaggag	gatcaacgtc	cattgcctgc	cccaacggat	900
gccaggctat	cgctgacact	ggtacttcac	tgattgccgg	acctaaggct	caagtggagg	960
ctatccagaa	attcatttgtt	gctgagccac	ttatgaaggg	agagtacatg	attccctgcg	1020
acaagggtgcc	ttccctcccc	gagctgtcct	tcgttatcga	gggcccggact	ttcatccctca	1080
agggtgaaga	ttacgttattt	accgtgaaag	ctgggtggtaa	atcgatctgc	ctgtccgggtt	1140

US seq list.ST25.txt

tcatggaaat ggacttcccg gagaggatcg gagagctgtg gattcttggaa	gacgtcttca	1200
ttggaaagta ctacactgtc ttcgatattg gccaaagctcg tcttggattt	gctcaggcta	1260
agtcagaaga tggctatccg gttggcctg ctgttcaag gtacaacaag	ttctcgagg	1320
acagcgacag tgacgaggat gatgtattca ctctctaaat aacatgtatc	cacaatttgc	1380
tctaatctcg atacgtgtac cgtgtctcac gtgttccac ttttgataaa	ctgattattc	1440
tg		1442

<210> 106
 <211> 446
 <212> PRT
 <213> *Ancylostoma ceylanicum*

<400> 106

Met Ala Arg Leu Val Leu Leu Leu Ala Leu Phe Thr Leu Ala Val Ala
 1 5 10 15

Ser Val His Arg Arg Thr Phe His Gln Pro Arg Arg Tyr Val Lys Ser
 20 25 30

Val Ser Leu Ser Arg Gln Pro Thr Leu Arg Glu Arg Leu Leu Gly Thr
 35 40 45

Gly Ser Trp Glu Asp Tyr Gln Lys Gln Arg Tyr His Tyr Gln Lys Lys
 50 55 60

Leu Leu Ala Lys Tyr Ala Ala Asn Lys Ala Ser Lys Leu Gln Ser Thr
 65 70 75 80

Asn Glu Ile Asp Glu Leu Leu Arg Asn Tyr Met Asp Ala Gln Tyr Phe
 85 90 95

Gly Thr Ile Gln Ile Gly Thr Pro Ala Gln Asn Phe Thr Val Ile Phe
 100 105 110

Asp Thr Gly Ser Ser Asn Leu Trp Val Pro Ser Arg Lys Cys Pro Phe
 115 120 125

Tyr Asp Ile Ala Cys Met Leu His His Arg Tyr Asp Ser Gly Ala Ser
 130 135 140

Ser Thr Tyr Lys Glu Asp Gly Arg Lys Met Ala Ile Gln Tyr Gly Thr
 145 150 155 160

Gly Ser Met Lys Gly Phe Ile Ser Lys Asp Asn Val Cys Ile Ala Gly
 165 170 175

US seq list.ST25.txt

Ile Cys Ala Val Glu Gln Pro Phe Ala Glu Ala Thr Ser Glu Pro Gly
180 185 190

Leu Thr Phe Ile Ala Ala Lys Phe Asp Gly Ile Leu Gly Met Ala Phe
195 200 205

Pro Glu Ile Ser Val Leu Gly Val Pro Pro Val Phe His Thr Phe Ile
210 215 220

Glu Gln Lys Lys Val Pro Ser Pro Val Phe Ala Phe Trp Leu Asn Arg
225 230 235 240

Asn Pro Asp Ser Glu Leu Gly Glu Ile Thr Leu Gly Gly Met Asp
245 250 255

Pro Arg Arg Tyr Val Glu Pro Ile Thr Trp Thr Pro Val Thr Arg Arg
260 265 270

Gly Tyr Trp Gln Phe Lys Met Asp Lys Val Gln Gly Gly Ser Thr Ser
275 280 285

Ile Ala Cys Pro Asn Gly Cys Gln Ala Ile Ala Asp Thr Gly Thr Ser
290 295 300

Leu Ile Ala Gly Pro Lys Ala Gln Val Glu Ala Ile Gln Lys Phe Ile
305 310 315 320

Gly Ala Glu Pro Leu Met Lys Gly Glu Tyr Met Ile Pro Cys Asp Lys
325 330 335

Val Pro Ser Leu Pro Glu Leu Ser Phe Val Ile Glu Gly Arg Thr Phe
340 345 350

Ile Leu Lys Gly Glu Asp Tyr Val Leu Thr Val Lys Ala Gly Gly Lys
355 360 365

Ser Ile Cys Leu Ser Gly Phe Met Gly Met Asp Phe Pro Glu Arg Ile
370 375 380

Gly Glu Leu Trp Ile Leu Gly Asp Val Phe Ile Gly Lys Tyr Tyr Thr
385 390 395 400

Val Phe Asp Ile Gly Gln Ala Arg Leu Gly Phe Ala Gln Ala Lys Ser
405 410 415

Glu Asp Gly Tyr Pro Val Gly Pro Ala Val Arg Arg Tyr Asn Lys Phe
420 425 430

US seq list.ST25.txt

Ser Glu Asp Ser Asp Ser Asp Glu Asp Asp Val Phe Thr Leu
435 440 445

<210> 107
<211> 582
<212> DNA
<213> Ancylostoma ceylanicum

<400> 107
ggtactgcag ggttaattt cccaaatggaggacatgc catacctcgc attcattgtc 60
gcactactag cctgcactgt tatgtctggt cacggtaaa tgacgggtgg attaacgaag 120
caggacccca atgatcctga gcacatggcg agagcatgga aggccgcgaa aggtatcaat 180
gaggatgcac ccaacgctgg accgtaccac atgattccca ttaagattgt caaggctgaa 240
tctcaagtgc tggctgggt tagatacata tttgaagtat tgttcggcga atcaacatgt 300
aagaaaggac atatggctgc aacagagctt tctgcctcca actgtgaact aaaagaagga 360
ggaaaccgag ctctgtataa agtggagctc tggagaagc catggagaa ctttgagcag 420
ttcaatgttg agaagatccg aaatgttgc gctggcgagc aaatctaacc tgcttctta 480
agacacctca ctgaatattt aatattttgt atgtcatgta taatacgcacg cgatttttt 540
tatctcacgt actttttca ctgtgacaat tgccttctct gc 582

<210> 108
<211> 143
<212> PRT
<213> Ancylostoma ceylanicum

<400> 108

Met Pro Tyr Leu Ala Phe Ile Val Ala Leu Leu Ala Cys Thr Val Met
1 5 10 15

Ser Gly His Gly Gln Met Thr Gly Gly Leu Thr Lys Gln Asp Pro Asn
20 25 30

Asp Pro Glu His Met Ala Arg Ala Trp Lys Ala Ala Lys Gly Ile Asn
35 40 45

Glu Asp Ala Ser Asn Ala Gly Pro Tyr His Met Ile Pro Ile Lys Ile
50 55 60

Val Lys Ala Glu Ser Gln Val Val Ala Gly Val Arg Tyr Ile Phe Glu
65 70 75 80

Val Leu Phe Gly Glu Ser Thr Cys Lys Lys Gly His Met Ala Ala Thr
85 90 95

US seq list.ST25.txt

Glu Leu Ser Ala Ser Asn Cys Glu Leu Lys Glu Gly Gly Asn Arg Ala
100 105 110

Leu Tyr Lys Val Glu Leu Trp Glu Lys Pro Trp Glu Asn Phe Glu Gln
115 120 125

Phe Asn Val Glu Lys Ile Arg Asn Val Ala Ala Gly Glu Gln Ile
130 135 140

<210> 109

<211> 528

<212> DNA

<213> Necator americanus

<400> 109

gaaaaggcctc catagtcatg ctcaagctcg ttgcactcgt ttgcctgggtt gcaatctgct 60
tcgctcagg accacaagga cccccctccgt tcctgcaaag tgctccagcg gctgttcaac 120
aagacttcga caagctcttc gtcaatgctg gctccaagac ttagtgcagaa atcgacaaaa 180
tggtccaaga ttgggttggc aaacaagatg catccatcaa gaccgcattc gatgcgttcg 240
tgaaggaagt gaaagccgct caagcgcaag gtgaagctgc ccatcaggct gctatcgcca 300
agttcagcgc agaggccaaa gcggctgatg ccaagctgag cgcaattgcg aacgacaggt 360
cgaagacaaa cgcccaaaag ggagctgaga tcgactcggt actcaaggga cttccctccaa 420
atgtccgcac agagatcgaa aacgccatga aaggataaga agtctctatt ttgtatatat 480
gaaccgataa atatgcacaa taaaaaaaaaaa aaaaaaaaaaaa aaaaaaaaaa 528

<210> 110

<211> 146

<212> PRT

<213> Necator americanus

<400> 110

Met Leu Lys Leu Val Ala Leu Val Cys Leu Val Ala Ile Cys Phe Ala
1 5 10 15

Gln Gly Pro Gln Gly Pro Pro Pro Phe Leu Gln Ser Ala Pro Ala Ala
20 25 30

Val Gln Gln Asp Phe Asp Lys Leu Phe Val Asn Ala Gly Ser Lys Thr
35 40 45

Asp Ala Glu Ile Asp Lys Met Val Gln Asp Trp Val Gly Lys Gln Asp
50 55 60

Ala Ser Ile Lys Thr Ala Phe Asp Ala Phe Val Lys Glu Val Lys Ala
65 70 75 80

US seq list.ST25.txt

Ala Gln Ala Gln Gly Glu Ala Ala His Gln Ala Ala Ile Ala Lys Phe
85 90 95

Ser Ala Glu Ala Lys Ala Ala Asp Ala Lys Leu Ser Ala Ile Ala Asn
100 105 110

Asp Arg Ser Lys Thr Asn Ala Gln Lys Gly Ala Glu Ile Asp Ser Val
115 120 125

Leu Lys Gly Leu Pro Pro Asn Val Arg Thr Glu Ile Glu Asn Ala Met
130 135 140

Lys Gly
145

<210> 111
<211> 1672
<212> DNA
<213> Necator americanus

<400> 111
gaaaggttta attacccaag tttgaggatg aagattgccccc tggttgttct gctgttagtc 60
gcctacgcaa attctgcgga catcttcaga actgaatttg gagctaaaat aaaagcagag 120
gcggataaaa gtaagacgaa actaaatatc tcctctcttc ttcaagtccg tggaaattc 180
ctcaagttaa gacaacagat caaggagagc ttagctctga ccccgaaacg aaaagagttg 240
ttgcataagt ttagtcgagaa attagtacac atcaaaaagg atcatgttca taagggttgt 300
gactcaatcg atgaaatcaa taagaagggtt ggaatgtcag atctgctcta cgatggtgat 360
atggttctaa cgaaagagca agccgaggaa atggtagcgt atatcgacgg aagtggaaagc 420
aaccgtgcaa agcgtcaagc gtatcgtaac aaactttatc cgaaaacact ttggaccgat 480
ggagttatct attatttcca tccttagtgca acgaatagca tgcgaagtgtt gttcctgaaa 540
gcagcaaaag aatggagctc tcaaacgtgt atcgatttcc atgaggatgtt ggttggaaatg 600
ggcccaaaca ggtcaaggt tttcaaaagag aaagggttgggtt ggtcgatgggt tggacgactc 660
cctcgtccac aggagctttc gttggaaaga ggatgtgata cgattgccac agcacaacac 720
gagatcggttcc atgcgttggg attcttccac cagcaggctt gacacgtcg cgatgactac 780
attgtattta attcagagaa tgttagtgccg cgatatctgg atcaattcaa gaaacagagc 840
aaagaaaacaa acgataatta cggattaact tatgattacg gaagcaccat gcagtacgg 900
tcgaccagcg gatcccaaaa tggaaaacctt acaatggtgc caaaagatcc taaatata 960
gaaaccctgg gatcaccttt cattgcattt tacgatttac tggcaataaa tacgcactac 1020
aaatgtcttg agaaatgcga taataatggg gcacaatgca aaatgggtgg attccctaatt 1080

US seq list.ST25.txt

ccaagagatt	gctcaaaatg	catttgtccc	agtggatacg	gtggcgctac	atgtgaccag	1140
aaacctgaag	gatgtggtga	agtacttgaa	gcaacgaagg	aggctaaaac	cctcaaaagt	1200
gaaattggag	ataaaagtgc	aggagatgag	gacagagagg	acatgaccaa	gtgttactat	1260
tggatcaagg	caccggaagg	atcgaaagtt	gaggtaaga	tcgtaaacct	agctaaaggt	1320
cttgcattg	atggatgcag	atattgggt	gtggaaattha	aaactcagga	ggatcaacgt	1380
gcttcggat	acagattctg	cgctccgaa	gatgctggcg	tcactttgga	gtcgactcg	1440
aatattgtcc	ctataatagc	gttcaataga	cacggctcta	ctgaatttga	attacagttac	1500
cgaatcgtat	aattctgcgt	gaccaacgct	tctcctaaga	gacgagaaag	ttctgcaaca	1560
atactttatt	catgtataac	aatataaggag	agttttctt	agtagaagta	ctttcttgc	1620
tggttctcca	gaaataaaacg	atttccatgc	aaaaaaaaaa	aaaaaaaaaa	aa	1672

<210> 112

<211> 494

<212> PRT

<213> Necator americanus

<400> 112

Met Lys Ile Ala Leu Val Val Leu Leu Leu Val Ala Tyr Ala Asn Ser
1 5 10 15

Ala Asp Ile Phe Arg Thr Glu Phe Gly Ala Lys Ile Lys Ala Glu Ala
20 25 30

Asp Lys Ser Lys Thr Lys Leu Asn Ile Ser Ser Leu Leu Gln Val Arg
35 40 45

Gly Lys Phe Leu Lys Leu Arg Gln Gln Ile Lys Glu Ser Leu Ala Leu
50 55 60

Thr Pro Glu Arg Lys Glu Leu Leu His Lys Leu Met Gln Lys Leu Val
65 70 75 80

His Ile Lys Lys Asp His Val His Lys Gly Gly Asp Ser Ile Asp Glu
85 90 95

Ile Asn Lys Lys Val Gly Met Ser Asp Leu Leu Tyr Asp Gly Asp Met
100 105 110

Val Leu Thr Lys Glu Gln Ala Glu Glu Met Val Ser Asp Ile Asp Gly
115 120 125

Ser Gly Ser Asn Arg Ala Lys Arg Gln Ala Tyr Arg Asn Lys Leu Tyr
130 135 140

US seq list.ST25.txt

Pro Lys Thr Leu Trp Thr Asp Gly Val Ile Tyr Tyr Phe His Pro Ser
145 150 155 160

Ala Thr Asn Ser Met Arg Ser Val Phe Leu Lys Ala Ala Lys Glu Trp
165 170 175

Ser Ser Gln Thr Cys Ile Asp Phe His Glu Asp Val Val Gly Met Gly
180 185 190

Pro Asn Arg Ile Lys Val Phe Lys Glu Lys Gly Cys Trp Ser Met Val
195 200 205

Gly Arg Leu Pro Arg Pro Gln Glu Leu Ser Leu Gly Arg Gly Cys Asp
210 215 220

Thr Ile Ala Thr Ala Gln His Glu Ile Gly His Ala Leu Gly Phe Phe
225 230 235 240

His Gln Gln Ala Arg His Asp Arg Asp Asp Tyr Ile Val Phe Asn Ser
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Glu Asn Val Val Pro Arg Tyr Leu Asp Gln Phe Lys Lys Gln Ser Lys
260 265 270

Glu Thr Asn Asp Asn Tyr Gly Leu Thr Tyr Asp Tyr Gly Ser Thr Met
275 280 285

Gln Tyr Gly Ser Thr Ser Gly Ser Gln Asn Gly Lys Pro Thr Met Val
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Pro Lys Asp Pro Lys Tyr Ile Glu Thr Leu Gly Ser Pro Phe Ile Ala
305 310 315 320

Phe Tyr Asp Leu Leu Ala Ile Asn Thr His Tyr Lys Cys Leu Glu Lys
325 330 335

Cys Asp Asn Asn Gly Ala Gln Cys Lys Met Gly Gly Phe Pro Asn Pro
340 345 350

Arg Asp Cys Ser Lys Cys Ile Cys Pro Ser Gly Tyr Gly Gly Ala Thr
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Cys Asp Gln Lys Pro Glu Gly Cys Gly Glu Val Leu Glu Ala Thr Lys
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Glu Ala Lys Thr Leu Lys Ser Glu Ile Gly Asp Lys Ser Ala Gly Asp

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Glu Gly Ser Lys Val Glu Val Lys Ile Val Asn Leu Ala Lys Gly Leu
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Ala Ile Asp Gly Cys Arg Tyr Trp Gly Val Glu Ile Lys Thr Gln Glu
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Asp Gln Arg Ala Ser Gly Tyr Arg Phe Cys Ala Pro Glu Asp Ala Gly
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us seq list.ST25.txt

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Gly Asp Phe Phe Thr Lys Gln Phe Asn Asn Val Lys Asp Leu Phe Ala
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Lys Asp Gln Asp Thr Leu Glu Lys Asn Ile Asn Leu Val Lys Asp Leu
50 55 60

Leu Ile Ala Ile Lys Glu Lys Ala Lys Met Leu Glu Pro Met Ala Asn
65 70 75 80

Glu Ala Gln Lys Lys Thr Leu Gly Gln Val Asp Asn Tyr Leu Asn Glu
85 90 95

Val Gln Gln Phe Gly Asp Gln Val Ala Lys Glu Gly Ser Thr Lys Phe
100 105 110

Glu Glu Asn Lys Gly Lys Trp Gln Gln Met Leu Asn Asp Ile Phe Glu
115 120 125

Lys Gly Gly Leu Asp Ser Val Met Lys Leu Leu Asn Leu Lys Ser Gly
130 135 140

Gly Arg Cys Thr Leu Ala Ala Leu Val Ala Pro Val Val Leu Ala
145 150 155 160

Leu Ile Arg